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A CATALOGUE OF THE FISHES OF GREECE, WITH NOTES ON THE NAMES NOW IN USE AND THOSE EMPLOYED BY CLASSICAL AUTHORS.

BY HORACE ADDISON HOFFMAN AND DAVID STARR JORDAN.

The first-named author of the present paper spent a large part of the spring and summer of 1890 in Greece. Part of this time was devoted to making collections of the fishes found in the markets of Athens and to the study of the vernacular names now applied by the Greek fishermen to these fishes. Each fish as obtained was preserved in alcohol, a number attached to it, and a record kept of the vernacular name attached to this number.

The persistence of vernacular names of fishes and other animals is known to be very great, and it may be safely assumed that the most of these names now heard in Athens are derived from those applied to the same species in the time of Aristotle. It has been thought that a study of these names would tend to throw light on those applied to fishes by classical authors. The fact that no such collection or comparison of names of fishes has yet been made is the justification of this paper.

A single catalogue of the fishes of Greece is known to me, that published by my friend, Professor Apostolides in 1883 (La Pêche en Grèce: par Nicolas Chr. Apostolidès). This work contains numerous vernacular names and it has been largely drawn upon in the present paper.

In this paper is printed a systematic list of the fishes known from Greece, either on the authority of Apôstolides or from my own collection, with the vernacular names and such notes on them as I am able to offer.

No one can be more fully aware than I am, of the unsatisfactory character of many things in this paper. It was often difficult or impossible to make out with certainty just what Aristotle meant. Some terms occurring over and over and evidently having a very definite meaning to him are obscure to us, and the meanings given in the dictionaries are only guesses. A good illustration of this is the word ὑπόζωμα, usually translated diaphragm. We have no right to assume that Aristotle always, or ever, meant by this term the diaphragm, especially in those instances where it makes him entirely wrong in regard to the anatomical facts. In those matters which could be seen by dissection I feel convinced that Aristotle made the dissections for himself and reported what he saw. He may not always have seen aright in nice points, and he certainly did not understand what he saw as it is understood in the light of modern science; but there is no ground for assuming that he did not see what would be apparent to any one who took the least pains to look, even if with unpractised eye. A striking confirmation of the correctness of his observation in matters of anatomy was afforded by the repeated statement that the *βάτραχος* (*Lophius piscatorius*) has its gall bladder upon the intestine, not upon the liver. A dissection of this fish by Dr. Charles H. Gilbert proved the statement of Aristotle to be correct. I believe that a reading of Aristotle in the original accompanied by dissections of the animals in question would bring one to a much better understanding of his anatomical terms, which are much in need of some such elucidation.

It is quite otherwise when he comes to the habits of the fishes and other matters than anatomical knowledge. Here he has to depend upon the observations of the fishermen and others, and what he has to say simply records the prevalent beliefs. Of course much of this fisherman's lore is real knowledge gained from observation, but it has also a considerable share of myth.

Another great source of difficulty is corruption of the text. Considering all the time and the vicissitudes that the Mss. of Aristotle have passed through it is always more or less problematical as to whether in any given passage we have just what Aristotle said.

For the nomenclature and systematic arrangement of the species, the identification of my specimens, and for all matters purely zoological in character I am indebted to Dr. David S. Jordan, at whose suggestion the work was undertaken. The specimens obtained are in the museum of the University of Indiana.

Explanatory Notes.

1. The following order of statement has been adopted: (1) Scientific name by Dr. Jordan. (2) M. G. (Modern Greek) name or names heard by me in Greece, if any; each name followed immediately by a small figure in parenthesis indicating the number of specimens secured under that name. (3) A reference to the page of Apostolides' book (La Pêche en Grèce par Nicolas Chr. Apostolidès, Athens, 1883), where the species is given, followed by the scientific

name used by him, and the vernacular name or names given by him. (4) The similar name or names from A. G. (Ancient Greek) authors, chiefly Aristotle, references to the places in their works where these names are found, and a gathering up of the chief things said about the fish in question, especially anything which might in any way help to fix the identity of the species.

Explanatory remarks and comments are thrown in wherever in each case it seems most suitable.

2. Modern Greek names marked with an asterisk (*) were heard by me in the market at Athens, sometimes elsewhere in Greece, but do not occur in Apostolides' list.

3. Names marked with a dagger (†) occur in Apostolides, but were not heard by me in Greece.

4. Names not marked by any sign were both heard by me and found in Apostolides. They are not marked if the variations in form are slight and insignificant, even if the forms are not identical.

5. When the names are derived from other sources the source is given in connection with the name.

6. The references to Aristotle are taken from the Index Aristotelicus of Hermann Bonitz, and, as there, refer to the page, column and line of the quarto edition of Aristotle's works issued by the Royal Academy of Prussia through Georg Reimer, Berlin.

The references to Athenaeus, mostly from the VIIth book, are given by book and section, Editio C. Tauchnitii, Otto Holtze, Leipzig, 1887.

7. Species obtained by me in Greece are marked H. The list which follows is that of Apostolides, the species arranged in accordance with the views of American authors and the accepted rules of nomenclature applied to their names.

Family **BRANCHIOSTOMATIDÆ.**

1. Branchiostoma lanceolatum (Pallas).

Apost. 35 (*Branchiostoma lanceola* or *Amphioxus lanceolatus*)

Family **PETROMYZONTIDÆ.**

2. Petromyzon marinus (L).

Apost. 34 (*Petromyzon marinus*), † *λάμπρινα*, Lat. *lampetra*, rock-sucker, Eng. lamprey ; *λάμπρινα* is evidently of Latin and Italian origin.

Family SCYLLIORHINIDÆ.

3. Scylliorhinus canicula (L).

Apost. 5 (*Scyllium canicula*), † *σϰυλί*, † *σϰυλόψαρο*, dog, dog-fish. A. G. *σϰύλαξ*, whelp, pup, dog. M. G. *σϰυλί(ον)*, dog. Aristotle, *σϰυλίον*, name of a fish, 565a 16–26; 566a 19.

According to Aristotle the ova of the *σϰυλίον* are grown fast between the branches of the oviduct about the backbone; as these ova increase in size they change their position and move around into one or the other branch of the oviduct, which is forked and grown fast to the *ὑπόζωμα* (diaphragm, peritoneum) just as in other similar fishes. The oviduct of both this and the other Galeodes has at a little distance from the *ὑπόζωμα* a kind of white breasts (oviducal glands) which are not present when they are not pregnant. The shells of their eggs are shaped like the tongues (reeds) of pipes (*αὐλοί*), and there are attached to them hair-like ducts. The other *γαλεοί* breed twice a year, but the *σϰυλίον* only once.

4. Catulus stellaris (L).

Apost. 5, 6 (*Scyllium catulus*), † *γάτος* = *ϰάτος*, cat. Byzantine and Roman times, *ϰάττα*, *ϰάττος*; Latin, *catta*, Martial 13, 69.

I find no ancient application of this name to a fish.

Family ALOPIIDÆ.

5. Alopias vulpes (Gmelin).

Apost. 6, † *σϰυλόψαρο*.

Family CARCHARIIDÆ.

6. Carcharias ferox (Risso).

Apost. 6. (*Odontaspis ferox.*)

Family LAMNIDÆ.

7. Lamna cornubica (Gmelin).

Apost. 6, † *σϰυλόψαρο*.

8. Isurus oxyrhynchus (Rafinesque).

Apost. 6 (*Oxyrhina spallanzani*), † *σϰυλόψαρο*.

9. Carcharodon carcharias (L).

Apost. 6 (*Carcharodon lamia*), † *ϰαρχαρίας*, † *λάμια*. See Athen. vii, 76. Athenaeus quotes several passages from ancient authors where the name *ϰαρχαρίας* occurs, and among them the following from Nicandrus the Colophonian in his "Glosses:" "The *ϰαρχαρίας* is called also *λάμια* and *σϰύλλα*."

The word *καρχαρίας* itself is from *κάρχαρος*, sharp, or sharp-toothed. The *Lamia* and *Scylla* were fierce man-devouring monsters of Greek myth.

Family GALEORHINIDÆ.

10. Galeus canis (Mitchell).

Apost. 7. (*Mustelus vulgaris.*)

11. Galeus mustelus (L).

Apost. 7. (*Mustelus lævis*) *γαλήός*.

12. Carcharhinus glaucus (L).

Apost. 7. (*Carcharias glaucus.*)

Family SPHYRNIDÆ.

13. Sphyrna zygæna (L).

Apost. 7 (*Zygæna malleus*), † *ζύγαινα*. Mentioned by Arist. 506b 10 among long fishes with the gall on the liver. Also mentioned by Epicharmus, Frag. 30.

I saw some fishermen catch a hammer-headed shark in the Bay of Eleusis, but all the names I could elicit were *κανῆκι* (?) possibly *κυνίκι* = little dog, and *ἀγριόφαρο* = fierce fish.

14. Sphyrna tudes (Cuvier).

Apost. 7 (*Zygæna tudes*), † *πατερίτσα*, crutch, bishop's staff.

Family HEXANCHIDÆ.

15. Heptranchias cinereus (Gmelin).

Apost. 7. (*Heptanchus cinereus.*)

Family SQUALIDÆ

16. Squalus acanthias (L).

Apost. 8. (*Acanthias vulgaris*) † *σκυλόφαρο*.

17. Squalus blainvillei (Risso). H. *Γαλεό(ς)* ($_1$).

Not noticed by Apostolides. Apost. 7 gives *γαληός* as common name for *Mustelus lævis*. *Γαλεός*, *γαλεοειδής* and *γαλεώδης* all occur quite frequently in Aristotle. 505a 15, 489b 5 and 6, 511a 4–6, 1529a 29, 621b 16, 565b 28, 543a 17, 566a 17, 565a 26, 754b 33, 565b 2ff, 508b 17 (Here *γαλῆ* is probably the proper reading, M. G. *γάλια*, *Lota fluviatalis*. Cf. Aelian xv, 11, Bonitz.), 565a 20, 566a 31, 565a 14, 540b 19, 505a 18, 505a 5, 506b 8, 507a 15, 540b 27.

According to Aristotle the *γαλεοί* are the long *σελάχη* with uncovered gills on their sides (sharks), as distinguished from the flat *σελάχη* with uncovered gills underneath them (rays). The *γαλεοί* are ovoviviparous, produce at the most three young at a time, and admit their offspring into themselves (into their mouths) and let them out again. The ποικίλος and ἀλωπεκίας do this especially, but others do not because of their roughness. The γαλεοί have a mouth opening wide (literally ‘breaking back’). The ἀκανθίας (thorny) γαλεός has its ova attached to the ὑπόζωμα (peritoneum [?]) above the oviducal glands, and when the ovum descends upon its having been loosed the young fish is produced. In the same way generation takes place in the ἀλώπηξ. But the so-called smooth γαλεοί have their ova between the branches of the oviduct like the σκυλίον. The ova moving about descend into one or the other branch of the oviduct and the young are produced, having the umbilical cord attached to the oviduct, so that when the eggs are used up these fish seem to have an embryo just like the quadrupeds. In the case of the σκυλία, which some call νεβρίαι γαλεοί (i. e. γαλεοί dappled like a fawn, fawn-colored sharks), when the shell of the egg bursts and falls off the young fish is born. There are several kinds of γαλεοί, e. g. ἀστερίας, κεντρίνης, ἀκανθίας, λεῖος, ποικίλος, σκύμνος, ἀλωπεκίας. See Athen. vii, 43.

In 508b 17 γαλεοί are mentioned among fishes which have many pyloric appendages, but this is thought to be a corrupted reading for γαλῇ. See above under references.

The γαλεοί and γαλεοειδεῖς, as ἀλώπηξ and κύων, and the flat fishes, νάρκη, βάτος, λειόβατος and τρυγών produce their young alive, having first produced eggs internally. The form of the uterus (oviduct) must be seen from dissections. The γαλεώδη have it different from one another and from the flat σελάχη. For in some cases the ova are grown fast around the back bone between the branches of the uterus (oviduct, ὑστέρα), just as has been said in the case of the σκυλίον. As the ova increase in size they move around. The uterus being forked and grown to the ὑπόζωμα (diaphragm, peritoneum) just as that of others of this kind, the ova come around into one or the other branch of the uterus (oviduct). Both the uterus of this and that of the other γαλεοειδεῖς at a little distance from the ὑπόζωμα have what resembles white breasts (oviducal glands) which are not present when they are not pregnant.

The γαλεώδεις all have their gills double and five on each side. They also have the gall bladder on the liver, and the two parts of the liver are independent, the beginning not being grown together. The males differ from the females by having two appendages hanging about the vent.

18. Oxynotus centrina.

Apost. 8 (*Centrina vulpecula*), *γουρουνόψαρο*.

The word is M. G. and means hog-fish. So A. G. *χοῖρος*, hog, was used as name of a fish found in the Nile. Strabo 823, Athen. 312 A. (vii, 88).

I saw the *γουρουνόψαρο* in the market at Athens and heard the name from the market men, but the specimen was too large to be preserved.

Family SQUATINIDÆ.

19. Squatina squatina H. * *ῥίνα* ($_1$), * *σορσόλλα* ($_1$).

Not noticed by Apostolides; *ῥίνη* (v. l. *ῥίνα*), Arist. 543b 9, 540b 11, 746b 6, 543a 14, 565b 25, 1529a 16, 697a 6, 620b 30 31, 506b 8, 566a 20 22 27, 622a 13.

The *ῥίνη* is one of the *σελάχη*, has the gall on the liver, has a large tail and copulates belly to belly. It breeds twice a year, in autumn and again about the setting of the Pleiades, producing seven or eight young each time. It allows its young to pass in and out (of its mouth). The *ῥίνη* seems to cross with the *βάτος* and produce the fish called *ῥινόβατος*. This has the head and fore parts of the *βάτος* but the rear parts of the *ῥίνη*, as if born from both. Like the *ὄνος*, *βάτος* and *ψῆττα* it buries itself in the sand and then waves the filaments in its mouth. It changes its color to that of the rocks on which it is, or to that of its other surroundings, so that it is not easily seen.

Athen. vii, 89, says the *λειόβατος* (smooth *βάτος*) is also called *ῥίνη*.

Family RHINOBATIDÆ.

20. Rhinobatus columnæ (Muller & Henle).

Apost. 8. † *Καλκάνι*.

Family TORPEDINIDÆ.

21. Torpedo torpedo (L).

Apost. 8 (*Torpedo marmorata*), † *μουδιάστρα*, from M. G. *μουδιάζω*, to benumb. Compare ancient *νάρκη*, Aristotle, 506b 9, 505a 4, 540b 18, 566a 32, 695b 8 9, 696a 27, 1527b 40, 1530a 12, 696a 31, 695b 11, 620b 19 29, 1530a 15, 543b 9, 566a 23, 565b 25, 620b 20 26.

Νάρκη means *numbness, torpor, stiffness.* The verb *ναρκάω* means to *grow numb*, to *be stiff*, Lat. *torpere.*

Arist. gives the following points with regard to the *νάρκη*:

It is a flat *σέλαχος* and like all such has its gills underneath it and is ovoviviparous. It has the gall on the liver, has a long spiny tail. It has its dorsal fins transferred to its belly, where, on account of its shape, they will be more useful, and its *belly* (ventral and pectoral [?]) fins near the head. It has two fins near (or on) its tail. For two fins it uses its flat edges. The *νάρκη* benumbing (*ναρκᾶν ποιοῦσα*) the fishes which it intends to catch, taking them into its mouth in the way which it has, feeds on these. It buries itself in the sand and mud and captures the fishes swimming up to it, which it stuns (*ναρκᾶν ποιεῖ*). A proof that they live in this way is that they are often caught having in them the *κεστρεύς*, one of the swiftest of fishes, the *νάρκη* itself being one of the slowest. Some persons have been eye witnesses of their mode of capturing their prey. It is well known that they stun people also. It hunts little fishes for its food, catching them by rendering them numb (*ναρκᾶν*) and unable to move. The *νάρκη* and *ῥίνη* spawn a little before the antumnal equinox. They take their young into themselves (their mouths) and let them out again. A large *νάρκη* has been seen with about 80 young in it.

Aristotle frequently mentions it in close connection with *τρυγών*, *βάτος* and *ῥίνη*, implying that they belong to the same general class.

See also Athen. vii, 95, where the same facts with regard to its stunning power are repeated. Theophrastus says it can send a shock even up through a fish-spear to a man's hand.

Family **RAJIDÆ.**

22. Raja clavata (L).

Apost. 8.

23. Raja batis (L).

Apost. 8 (*Raia batis*), *βατί.* *Βατί* = *βατί(ον)* is the natural M. G. equivalent for A. G. *βάτος*.

24. Raja punctata H., *βάτος* ($_1$).

Apost. 8 (*Raia punctata*).

The *βάτος* is repeatedly mentioned in Aristotle. 489b 6, 489b 31, 505a 4, 540b 8, 565b 28, 566a 28 32, 599b 29, 620b 30, 695b 28, 696a 25, 697a 6, 709b 17, 746b 6.

According to Aristotle the *βάτοι* form one division of the *σελάχη*, are flat, have a tail (*κέρκος* = tail like that of a quadruped. The word *κέρκος* is not applied to the tail of a fish, such as a sunfish, etc.) ; they have uncovered gills (no opercula), have no scales, but a rough skin ; they have no fins but " swim by means of their flatness itself," or, as is said in another place, by means of the outer edge of their flatness. They have their gills *under* them, whereas the γαλεώδη have them in the side. The flat selache with tails, as the βάτος, τρυγών and the like, copulate not only with belly to belly, but also by mounting with their bellies upon the backs of the females in those kinds in which the tail is not so thick as to be in their way. Of the flat fish the βάτος and τρυγών do not receive their young into themselves because of the roughness of the tail. Some fishes lie quiet in the sand, others in the mud, keeping only the mouth above. The πετραῖοι, βάτοι and σελαχώδη lie hid during the wintriest days. The ὄνος, βάτος, ψῆττα and ρίνη bury themselves in the sand, and when they have made themselves invisible they wave (ραϐδεύεται) those things in their mouths which the fishermen call "rodlets" (ραϐδία) or little wands. None of the other fishes have been seen uniting in copulation with others not of their own kind; but the ρίνη and βάτος alone seem to do this; for there is a fish called ρινόϐατος, because it has the head and foreparts of the βάτος but the hind parts of the ρίνη, as if born from both of these. The γαλεοί and γαλεοειδεῖς, as the ἀλώπηξ and κύων, and the flat fishes, νάρκη, βάτος, λειόϐατος and τρυγών, are viviparous, having produced eggs (internally), i. e. are *ovoviviparous*. *Βατίς* also occurs in Aristotle. It may be merely a feminine form of βάτος used as a name of female βάτος. 1527b 41 43, 565a 22 27, 567a 13. "The σκυλία and βατίδες have shelly arrangements in which is found an eggy fluid. The form of the shell is like that of the tongues (reeds) of wind-instruments (pipes, αὐλοί), and there are hair-like ducts attached to the shells. In the case of the σκυλία, which some call νεϐρίαι γαλεοί, the young are produced whenever the shell breaks from around them and falls off; but in the case of the βατίδες whenever they lay the eggs the young comes forth from the shell, which has been broken off from around it." 565a 22ff. (The above passage is obscure and possibly corrupt. I do not understand the distinction made in the latter part.)

In 567a 13 Aristotle says that the female seal has a pudendum like that of the ϐατίς.

25. Raja miraletus H., σελάχι $(_{1})$.

Apost. 9 (*Raia miraletus*). Σελάχι, according to Apost., is a collective name for all species of rays.

Arist. σέλαχος, commonly in plur. σελάχη. 511a 5, 695b9, 489b 2, 516b 16, 655a 23, 732b 1, 754a 23, 476a 2, 732b 22, 520a 17, 538a 29, 540b 6, 755b 2, 598a 12, 591a 10, 697a 7, 516b 15, 516b 36, 655a 23, 696b 3 6, 697a 8, 517a 1, 476a 2, 489b 6, 505a 1 3 5, 695b 4, 489b 30, 676b 3 4 5, 520a 17 18 19, 564b 20, 718b 35, 733a 10, 754a 33, 733a 8 11, 537a 30, 535b 24, 538a 29, 540b 19 10 12, 621b 25 28, 570b 32, 489b 16, 718b 33, 754a 23 32, 564b 15 16, 492a 27, 503b 3, 511a 4 7 9 12, 516b 15, 475b 20, 676b 2, 718b 32, 732b 1, 754a 23, 755a 12, 755b 2, 676b 2, 566a 24, 570b 32, 566a 15, 565b 30, 566a 26, 571a 1, 540b 14, 755b 8 12, 539a 29, 505a 26, 489b 6, 540b 17, 505a 3, 517a 1, 540b 6 8 10 12 17, 565b 28, 489b 30, 565b 24–31, 695b 9, 1527b 40 44. Cf. also σελαχώδεις.

Σέλαχος is a term much used by Aristotle in a broad sense to include a wide variety of fishes. Σελαχώδης is also used, whether as equivalent to σέλαχος or in a still more comprehensive sense, is not clear. Pliny ix, 24 (78), says: "There is another kind of flat fishes which have cartilage for the spine (*pro spina*), as the *raiæ, pastinacæ, squatinæ, torpedo* and those which the Greeks call by the names *bovis* (βοῦς), *lamia, aquila* (ἀετός), and *rana* (βάτραχος), in which number are also the *squali* although these are not flat (*plani*). All these collectively Aristotle called σελάχη, he first having given them this name. We (Latins) can not give them a distinctive name unless we may be permitted to call them cartilaginous (*cartilaginea*)."

I gather the following points from Aristotle: Any animal is called a σέλαχος which, being without feet and having gills, is viviparous (or ovoviviparous). All the σελάχη except the βάτραχος are externally viviparous, having first produced eggs within themselves (i. e. are ovoviviparous).

Their uterus, or oviduct, is forked and extends to the ὑπόζωμα (diaphragm, peritoneum).

The σελάχη are βάτος, τρυγών, ῥίνη, βοῦς, λάμια, ἀετός, νάρκη, βάτραχος and all the γαλεώδη. They have uncovered gills; some are elongated in form, e. g. the γαλεοί; others flat, e. g. the βάτοι. Some of the σελάχη do not have fins, viz., the flat ones and those having tails, such as βάτος and τρυγών. These swim by means of the "flatness itself." But the βάτραχος has fins, and so do all which do not have the flat parts thin. Some are rough, others smooth. The viviparous fishes, such as the σελάχη, have cartilaginous bones (are χόνδράκανθα), but the oviparous ones have a spine like the backbone (ῥάχις) of quadrupeds. The liver of the σελάχη becomes fatty and an oil is melted from it, although the σελάχη themselves are very free from fat both in their flesh and abdomen.

They sleep at times so that they are even caught with the hand; they take their young into their mouths, except the βάτραχος, are purely carnivorous, and most of them have no pyloric appendages; the female is larger than the male, and the males can usually be distinguished from the females by two appendages hanging near the vent.

All the σελαχώδη have at the same time ova in great numbers above near the ὑπόζωμα, some larger and others smaller, while they already have embryos below. They are rough and without scales. They lie torpid during the wintriest days.

Galen vi, 737, derives the name σέλαχος from σέλας, a bright light or blaze, or shining. He says: "The skin of such creatures is rough and shining in the night, wherefore also some say they have been named σελάχια from having σέλας (a phosphorescence).

26. Raja undulata (Lacépède).

Apost. 9.

27. Raja fullonica (L).

Apost. 9 (*Raja chagrinea*).

Family AËTOBATIDÆ.

28. Aetobatis aquila (L).

Apost. 9 (*Myliobatis aquila*). † Ἀετός = eagle, Lat. aquila. Arist. 540b 18 mentions ἀετός as one of the σελάχη. Compare Plin. N. H. 9, 78, aquila.

29. Aetobatis bovina (Geoffrey St. Hilaire).

Apost. 9 (*Myliobatis bovina*). Χελιδόνα, in some parts of Greece. Χελιδόνα, the swallow, is also a common M. G. name for *Trigla hirundo*, as I found in the market at Athens.

Family DASYATIDÆ.

30. Dasyatis pastinaca (L).

Apost. 9 (*Trygon vulgaris*). † Τρυγών at Paros, † μούτρουβα at Chalcis. Arist. 598a 12, 1527b 40, 695b 9 28, 489b 31, 540b 8, 565b 28, 566b 1, 540b 8, 620b 24. Athen. viii, 21. Lat. Trygon, Plin. 9, 155.

Τρυγών as a bird is the turtle-dove. The fish called τρυγών, says Arist., is a flat σέλαχος with no fins, but swimming by means of its flat parts, has a rough tail, does not admit its young into its mouth, is pelagic, buries itself in the sand.

Family MANTIDÆ.

31. Mobula edentula (Brünnich).

Apost. 9 (*Cephaloptera giorna*).

Family CHIMÆRIDÆ.

32. Chimæra monstrosa L.

Apost. 9.

Family ACIPENSERIDÆ.

33. Acipenser sturio.

Apost. 10 (*Acipenser sturio*), † στουριόνι at Corfu.

Family SILURIDÆ.

34. Silurus glanis (L).

It is not known that this species really occurs in Greece.

35. Parasilurus aristotelis (Agassiz).

Apost. 31 (*Silurus glanis*). † Γλανός, called † γουλιανός (g(oo)l-(y)anós) at Larissa, where it is caught in the Penēus River. Γλανός at Vrachori. Aristotle 505a 17, 490a 4, 506b 8, 568b 15ff, 608a 3 4, 568a 22 b 22, 568a 25 b 14, 569a 3, 621a 21 b 2, 602b 22 24.

This species is identified by Apost. with the γλάνις of Aristotle. Agassiz and Garman refer Aristotle's account to *Parasilurus aristotelis*, found in the Acheloüs River, in Acarnania, Greece.

The χορδύλος, says Aristotle, swims with its feet and tail, and, to compare a small thing to a great, has a tail like the γλάνις. Some fish have four gills, each double except the last, as for instance κίχλη, πέρκη, γλάνις, κυπρῖνος. The γλάνις has the gall on the liver. The γλάνεις and πέρκαι emit the bunch of eggs (τὸ κύημα) united just as the βάτραχοι do. The larger γλάνεις lay their eggs in the deep places, some even a fathom deep, but the smaller ones lay them in more shallow water, usually near the roots of a willow or some other tree ; also near the reed and the βρύον (some kind of a weed). The growth of the γλάνις from the egg is very slow, wherefore the male watches them forty or fifty days that the offspring may not be devoured by the little fishes which happen along. The egg of the γλάνις is, when laid, as large as a grain of vetch. No pestilential (universal?) disease attacks the fishes of rivers and ponds, but peculiar diseases fall on some of them, as the γλάνις especially, because it swims near the surface, becomes star-struck in the time of the dog-star; it is also stupefied by loud thunder. The *γλάνεις* in the shallows are destroyed in large numbers by being struck by the dragon-serpent. The river and lake fish are best after the emission of the eggs and semen, when they recover their flesh. The *γλάνις* is not good while pregnant. In all the rest the males are better than the females, but the female *γλάνις* is better than the male.

Of the river fishes the male *γλάνις* bestows much care upon its young. The female departs when she has laid her eggs, but the male, remaining where most of the eggs collect, keeps guard over them, affording no other assistance except preventing the other small fishes from seizing the offspring. It does this forty or fifty days until the young, having grown, are able to escape from the other fishes.

Family **CYPRINIDÆ.**

36. Cyprinus carpio (L).

Apost. 30–31 (*Cyprinus carpio* and *collari*), called † *πλατίτσα* in Thessaly.

37. Carassius auratus (L.)

Apost. 31 (*Carassius auratus*), † *κοκκινόψαρο*, red-fish = † *χρυσόψαρο*, gold-fish. *Κόκκινος* is used of a light or yellowish-red, even of a yellow color, e. g. *κοκκινάδι τοῦ αὐγοῦ* is yolk of the egg.

38. Barbus meridionalis (Risso).

Apost. 31.

39. Tinca tinca (L).

Apost, 31 (*Tinca vulgaris*).

40. Leuciscus cephalus (L).

Apost. 31 (*Squalius cephalus*).

Family **CLUPEIDÆ.**

41. Harengula aurita (Cuv. & Val.) H. * *Φρίσσα* $(_1)$, *λάμπρινα* $(_1)$.

Apost. 31 (*Sardinella aurita*), † *φίσσα*, † *θρίσσα*, † *σαρδελομάνα* (mother of the sardine); † *κέππα* at Corfu. Arist. 621b 16, 1528a 40. Athenaeus vii, 137.

Aristotle speaks of the *θρίσσα* as one of the more bony fishes. Athenaeus says *Χαλκίδες* and the like, *θρίσσαι*, *τριχίδες*, *ἐρίτιμοι*. Dorio mentions the river *θρίσσα* and calls the *τριχίς τριχίας*.

Plainly ϑρίσσα (ϑρίχια), τριχίς and τριχίας are all derived from θρίξ (gen. τριχός) hair. Φρίσσα and φίσσα are corruptions of θρίσσα.

42. Harengula phalerica (Risso).

Apost. 31 (*Meletta phalerica*), † παππαλίνα. A doubtful species.

43. Clupea pilchardus (L). H. Σαρδέλα ($_2$), * τριχιός ($_1$).

Apost. 32 (*Alosa sardina*), σαρδέλα. Σαρδέλα is It. *sardelli*. This would seem to be connected by derivation with Lat. *sarda*, Plin. 32, 151 and 46; Sardina Col. 8, 17, 12. Σάρδη and σαρδήνη, Galen. Σαρδῖνος, Arist. 1531a 8, Athen. vii, 137.

Athenaeus says Χαλϰίδες and the like, θρίσσαι, τριχίδες, ἐρίτιμοι. Epainetus, in his work on fishes, says χαλϰίδες, which they also call σαρδῖνοι. Aristotle calls them (the χαλϰίδες or ἐρίτιμοι) σαρδῖνοι.

It is evident from the above that the names χαλϰίδες, σαρδῖνοι, θρίσσαι and τριχίδες were used for fishes similar to one another. This corresponds to the M. G. use of ϑρίσσα (*Harengula aurita*), σαρδέλα and τριχιός. Θρίσσα and τριχίδες, M. G. τριχιός, are derived from θρίξ, Gen. τριχός, hair, and doubtless refer to the fine hair-like bones of the sardines. Sardelli, sardinelli, σαρδῖνοι, may be diminutives from sarda, and all these words obviously are derived from Σαρδώ, the A. G. name of Sardinia. Cf. Athen. iii, 92 for σάρδα resemble the ϰολίας in size.

For τριχιός cf. τριχίας and τριχίς Arist. 569b 26, 598b 12, 543a 5, 1528b 1. The τριχίας breeds twice a year. From the Phaleric ϰωϐῖτις are produced μεμϐράδες, from these τριχίδες, and from these τριχίαι. The τριχίαι are caught only as they swim into the Pontus, but they are not seen coming out of it. Whenever one is caught in the neighborhood of Byzantium the fishermen cleanse their nets thoroughly, because it is not customary for it to swim out (i. e. they cleanse their nets because the catching of one is so unusual a thing as to be considered an evil omen and contaminating).

The reason for this is that they swim up the Ister (Danube) to where it splits and then come down into the Adriatic. This is proved by the fact that there the reverse happens; for they are not caught going into the Adriatic, but only swimming out.

Athen. vii, 137, τριχίδες. Aristophanes Knights, 662. Τριχίδες a hundred for an obol (3 cents).

44. Clupea alosa (L).

Apost. 32 (*Alosa finta*).

45. Clupea rufa (Lacépède).

Apost. 32 (*Alosa vulgaris*).

Family STOLEPHORIDÆ.

46. Stolephorus encrasicholus (L). H. * *Γαῦρος* $(_1)$.

Apost. 32 (*Engraulis encrasicholus*), † *χαψί*. *Γαῦρος* means proud, haughty, both in A. G. and M. G.

Family SALMONIDÆ.

47. Salmo fario (L).

Apost. 33 (*Trutta fario*), † *πέστροφα*.

Family SYNODONTIDÆ.

48. Synodus saurus (L). H. *Σκαρμός* $(_2)$.

Apost. 32 (*Saurus fasciatus*), *σκαρμός*. I find nothing corresponding to it in the A. G.

49. Aulopus filamentosus (Bloch).

Apost. 32.

Family PARALEPIDIDÆ.

50. Paralepis coregonoides (Risso).

Apost. 32.

51. Paralepis sphyrænoides (Risso).

Apost. 33.

Family ANGUILLIDÆ.

52. Anguilla anguilla (L). H. *Χέλι* $(_1)$.

Apost. 33 (*Anguilla vulgaris*), *χέλι*, † *σουβλομυτάρι* (spit-nose or awl-nose) at Missolonghi, † *γλαβίτσα* at Sciathus.

Χέλι is plainly the M. G. form of the A. G. *ἐγχέλυς*. Arist. 489b 27, 534a 20, 505a 15, 506b 9, 507a 11, 517b 8, 538a 3 13, 696a 4 b 22, 1529a 37, 567a 20 21, 569a 6 8, 504b 30, 520a 24, 570a 3 15 24, 505a 27, 696b 22, 708a 4 7, 707b 28, 741b 1, 570a 13, 591b 30, 709b 12, 762b 23 28, 608a 5, 520a 24, 1529a 24–35, 569a 8, 538a 11, 592a 3–27. The *ἐγχέλυς* is elongated and smooth, has only two fins, these fins towards the gills, has four single gills on each side, has the gall on the liver, has a gullet (*στόμαχος*), but this gullet is small, has but little fat about the stomach and caul, is neither male nor female, and does not engender anything from itself, as none of them has ever been found with eggs in it. What they call a difference of male and female in the ἐγχέλυς, in that the so-called male has the head larger and longer and the female small and pug-nosed, is not a difference of sex but of species. All male fishes have milt (θόρος) except the ἐγχέλυς, but this has neither eggs nor milt. The ἐγχέλυς passes from the lakes into the sea. They are not produced either from copulation or eggs. In some marshy lakes when the water has all been drained off and the mud has been scraped out the eels (ἐγχέλεις) make their appearance again when the rain water collects. They are not produced in the dry places, neither in the permanent lakes, for they live and are nourished by the rain water. Some persons suppose they are produced from the little worms found in some ἐγχέλεις. This is not true, but they are produced from the so-called "entrails of the earth" (earth-worms), which originate spontaneously in the mud and moist earth. Some (eels) have already been seen coming out of these (earth-worms), and others may be seen in those pulled to pieces. But in the sea and in rivers such things are produced, especially where there is putrefaction, in the sea weed of the sea, and about the margins of rivers and ponds where the heat is intense.

The ἐγχέλυς requires pure water and soon suffocates in foul water. The eel-raisers (ἐγχελοτρόφοι) keep the water constantly flowing in and out of their tanks. Those who fish for eels (ἐγχέλεις) stir up the water. The ἐγχέλεις which have died do not come up and float on the surface like most fish, for they have the stomach (κοιλία) small. (Possibly κοιλία, literally hollow, here means swimming bladder.) A few of them have fat, but most of them have not. They live five or six days out of the water, more when they are northern, fewer when southern. If transferred in spring from the lakes to the tanks they die, but not so in the winter. They do not endure violent changes of temperature, dying if plunged into cold water. Some live seven or eight years. The river ἐγχέλεις take food, devouring one another and plants and roots, and whatever they find in the mud. They feed mostly at night, but during the day they retire into the depths. Those which men call the females are the better; but they call them so by mistake, they being of different species.

The word ἐγχέλυς is at least as old as Homer (Il. 21, 203 and 353), and is probably cognate with the Latin *anguilla* and English *eel.*

Family CONGRIDÆ.

53. Ophisoma balearicum (De La Roche). H. * *Ζαλούπαρδος* ($_1$).

Not seen by Apostolides. If the word is genuine Greek it must mean foam-leopard or storm-leopard, from *ζάλη* (*ζάλος*), surging, foam, storm, and *πάρδος*.

54. Leptocephalus conger (L). H. *Μουγγρί* ($_1$).

Apost. 34 (*Conger vulgaris*, variety *Conger niger*), *μουγγρί*, † *δρόγγα* at Missolonghi. The *γόγγρος* of Aristotle 489b 27, 590b 17–19, 505a 27, 505a 14, 696a 4, 708a 3, 507a 10, 506b 18, 571b 1, 571a 28, 599b 6, 707b 28, 591a 6 10 18, 610b 15–17, 598a 13. All those fishes which are long and smooth, as the *ἐγχέλυς* and *γόγγρος*, have only two fins. Some fishes have two gills on each side, the one single and the other double, as e. g. the *γόγγρος* and *σκάρος*. Some of the *γόγγροι* have the gall upon the liver, others below, separated from it. A few of the fishes have a gullet (*στόμαχος*), as e. g. the *γόγγρος* and *ἐγχέλυς*, and these have it small. (For *στόμαχος* = *οἰσόφαγος* cf. 495a 18 b 19, 496a 2.) Only those fishes which lay the crumbling spawn (*τὸ ψαθυρὸν ᾠὸν*) have thin scales (*λεπίδες*). For the *γόγγρος* does not have such spawn, neither does the *μύραινα* nor the *ἐγχέλυς*. The *γόγγροι* also have egg-masses (*κυήματα*), but the egg-mass is not very apparent on account of the fat. It has a long egg-mass just as serpents have. But when placed upon the fire it makes its nature evident, for the fat smokes and melts but the eggs jump and crackle when squeezed out. And besides, if a person feels and rubs them with his fingers the fat feels smooth, but the spawn rough. Now some *γόγγροι* have fat but no spawn, while others, on the contrary, have no fat and much spawn, as has just been described. The *κάραϐοι* (Spiny lobsters?) overpower the *γόγγροι*; for on account of the roughness of the *κάραϐοι* the *γόγγροι* do not slip away from them. The *γόγγροι*, however, devour the *πολύποδες*, for the *πολύποδες* cannot manage them on account of their smoothness. Some *πολυπόδες* have their arms (*πλεκτάνας*, coils) eaten off by the *γόγγροι*. The *μύραινα*, *ὀρφός* and *γόγγρος* also hibernate (*φωλοῦσιν*, lie quiet or torpid). Frequently the *κεστρεῖς* and the *γόγγροι* live when the tail has been taken away up to the vent. The *κεστρεύς* is eaten off by the labrax and the *γόγγρος* by the *μύραινα*. The battle is to the stronger against the weaker, for the stronger devour the weaker. Some of the fishes change their places from the open sea to near the land and from the land to the open sea, avoiding the extremes of cold and heat. The τρυγών, σελάχη, white γόγγροι, χάννη, ἐρυθρῖνος and γλαῦκος are pelagic (πελάγιοι); but the φάγροι, σκόρπιοι, black γόγγροι, μύραιναι and κόκκυγες change from one place to the other. Some of the long and thick fishes, as the ἐγχέλυς, γόγγρος, etc., do not have the fins on the belly (i. e. the ventral and anal fins). They all eat one another (except the κεστρεύς), and the γόγγροι especially do so. Some have only two fins, as the γόγγρος, ἐγχέλυς, and a certain kind of κεστρεύς.

Latin *Conger* cf. Plin. N. A. 9, 72, 9, 57, 9, 87, 9, 185. Also *gonger*, 32, 147.

Family ECHELIDÆ.

55. Echelus myrus (L).

Apost. 34 (*Myrus vulgaris*).

Family OPHISURIDÆ.

56. Ophisurus serpens (L).

Apost. 34 (*Ophisurus serpens*), † φίδι τῆς θαλάσσης, serpent of the sea. Arist. θαλάττιοι ὄφεις, 505b 8 10, 621a 2.

The sea serpents (θαλάττιοι ὄφεις) are in other respects similar in form to the land serpents, but they have the head more conger-shaped; there are many kinds of the sea serpents, and they have every sort of color. They are not found in very deep places.

In the second reference Aristotle seems partly to contradict the above, saying, the sea serpent's color and body are similar to those of the γόγγρος except that it is of a duller color and more violent in its movements. If it is caught and let go it quickly goes down into the sand, boring through it with its beak. It has a sharper mouth than the serpents.

Family MURÆNIDÆ.

57. Muræna helena (L). H. Σμέρνα ($_1$).

Apost. 34 (*Muræna helena*), σμέρνα and † σμύρενα. A. G. both σμύραινα and μύραινα. Arist. 707b 29 31, 489b 28, 540b 1, 517b 8, 540b 34, 696a 6, 1530a 9, 591a 12, 598a 14, 543a 25 29, 504b 34, 505a 15, 696a 6, 506b 16, 599b 6, 540b 1, 543a 20 23 24 28, 1530a 10, 1530a 8, 610b 17. Athen. vii, 90.

Σμύραινα is identical with the form σμύρενα given by Apost., as both spellings would be pronounced exactly the same in M.

G. Σμέρνα, the usual M. G. form and the only one which I heard, is plainly a corruption of the same word.

According to Aristotle the μύραινα is a *long* fish, does not have a crumbling egg-mass, has no scales, eats flesh only, is alternately pelagic and littoral, lies torpid for a season, is stronger than the γόγγρος and eats off the tail of the γόγγρος, has no fins, and uses the sea as serpents do the land ; (*i. e.* moves through the sea in the same way as serpents move over the ground); its gills are not articulated like those of other fish; it has four single gills on each side, has the gall bladder on the entrails and is long like a snake; they copulate by twining around one another and bringing belly to belly like snakes, spawn at any and every season, lay many eggs, and the young grow rapidly. "The σμῦρος and the σμῦραινα differ, for the σμῦραινα is variegated and weaker, but the σμῦρος is of uniform color and strong, and it is colored like the pine tree and has teeth both within and without. People say, just as they say other things, that the one is male the other female. These come out on the dry land and are caught there frequently.

According to Athenaeus, Theophrastus says the ἐγχέλυς and μύραινα can live a long time out of water, because they have small gills. Dorio says the river μύραινα has, like the ὀνίσκος, only one spine. Some people claimed that the μύραινα came out on land and held intercourse with snakes, from which were engendered venomous μύραιναι.

Athen. vii, 91, μῦρος. There are two kinds, one black and the other reddish, but the black ones are best. Lat. *Murœna.*

In ancient writings the μύραινα, γόγγρος and ἐγχέλυς are regularly mentioned together showing that there was some considerable resemblance to one another, and that they were regarded as all belonging to the same general class. In connection with the current report noted by Aristotle to the effect that of μῦρος and μύραινα one was male the other female, it is interesting to note that the same belief is current among the fishermen of Greece of the present day. I was told in the market at Athens that *Murœna helena* was the female and *Gymnothorax unicolor* was the male of the same species, both called σμέρνα.

58. Gymnothorax unicolor (De La Roche). H. Σμέρνα $(_1)$.

Not noticed by Apostolides. Said by the Greek fishermen to be the male, while *Murœna helena* is considered the female σμέρνα. For ancient references to the σμύραινα or μύραινα see *Murœna helena.*

Family ESOCIDÆ.

59. Esox belone (L). H. *Ζαργάνα* $(_1)$.

Apost. 32 (*Belone acus.*), † *βελονίδα, ζαργάνα.* Aristotle makes frequent mention of a fish called *βελόνη*. *Βελονιδα* would be a natural M. G. equivalent for this. See Arist. 610b 6, 506b 9, 543b 11, 571a 2ff, 567b 18, 755a 33, 616a 32.

Βελόνη = needle. Cont. Lex. gives also *βελονίδι* and *βελόνι* as names for the needle-fish.

From Aristotle I glean the following statements with regard to the *βελόνη*:

It is a long fish (i. e. not flat) and has the gall bladder on the liver. It spawns in winter. When it is time for it to spawn it bursts open and so the eggs come out; for this fish has a sort of division (partition) under the belly and intestine (*ἦτρον*) just as the snakes called *τυφλίναι* have. After it spawns these parts grow together again. Its eggs are spread around it just as in the case of the spiders, for the female *βελόνη* lays them attached to herself, and if any one touches them they scatter. The *βελόναι* run in shoals. The halcyon seems to make its nest chiefly from the bones of the *βελόνη*.

See Athen. vii, 111, where *βελόνη* = *ῥαφίς*. Vide under *κατρολίδρα*, *σακκοράφα*, *Syngnathus acus.*

Ζαργάνα. Cont. Lex. *ζαργάνη* and *σαργάνα*, needle-fish. *Σαργάνη* in A. G. means a braid, a basket. Arist. 610b 6, has *σαργῖνος* mentioned among fish found in schools. This may easily be a mistake for *σαρδῖνος*. *Σαργῖνος* occurs also in Athen. vii, 313 and 321. The name seems to be a derivative of *σαργός*. Cf. also Athen. viii, 52, *ῥαφίς* or *βελόνη*, called also *ἀβλεννής*.

Family EXOCŒTIDÆ.

60. Scombresox rondeletii (Cuv. & Val).

Apost. 32.

61. Exocœtus volitans (L).

Apost. 32 (*Exocœtus volitans*), *χελιδονόψαρο(ν)*, swallow-fish. The specimen sold me under the name *χελιδονόψαρο(ν)* was *Dactylopterus volitans,* Apost. 15, also given as *χελιδονόψαρο* by Apostolides.

Family SYNGNATHIDÆ.

62. Hippocampus hippocampus (L).[1] H. *Ἀλογάκι* $(_1)$.

Apost. 11 (*Hippocampus brevirostris*), *ἀλογάκι*, little horse. This would seem to be the fish called *ἱππόκαμπος* by the ancients. Aristotle does not mention the ἱππόκαμπος. The word was used by the poets as the name of a sea monster, half horse and half fish, on which the sea gods rode. As the name of a fish it seems to occur only in late writings. Its stomach was regarded as a poison of peculiar power and also as possessing medicinal and magic powers. See Menand. Incert. 211, Strabo 384, Philostratus 774, Dioscorides 2 3, Aelian N. A. **14**, 20, Plin. N. H. **32**, 58 67 83 93 109 113 139 149, **36**, 26. The references in Pliny refer chiefly to the use of the Hippocampus and its ashes as a medicine. In none of the references which I have examined in either Greek or Latin is there anything given, so far as I can see, which helps to identify the animal. The only reason, so far as I know, for identifying it with the sea horse is the mythological use of the term and the fact that the first part of the name is undoubtedly ἵππος, horse. Τὸ κάμπος occurs as the name of a sea monster in Lycophron 414. Κάμπη = caterpillar. Κάμπτω ✓ καμπ = to bend. These words may all be connected in origin and meaning.

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[1] Apostolides records also *Hippocampus guttulatus* Cuvier—probably an error in identification, as the American species is unknown in the Mediterranean.

Ἱπποκάμπιον, Epicharmus 16, Ahr.

63. Siphonostoma acus (L). H. Κατρολίδρα $(_2)$.

Apost. 11 (*Syngnathus acus*), κατουρλίδα, † σακκοράφα (sack-needle).

Ῥαφίς (Gen. ῥαφίδος), needle, occurs as the name of a fish in Athen. vii, 111. In a quotation from Epicharmus occurs the expression ὀξύρυγχοι ῥαφίδες, sharp-billed ῥαφίδες. Dorio says "the βελόνη which they call ῥαφίς," needle. Arist. in the fifth book of Parts of Animals calls it βελόνη, but in his work on animals or fishes, having called it ῥαφίς, he says that it is toothless. Speusippus calls it βελόνη. Cf. βελονίδα.

64. Typhle typhle (L). H. Κατρολίδρα $(_2)$.

Apost. 11 (*Siphonostoma argentatum*).

65. Syngnathus æquoreus (L).

Apost. 11 (*Entelurus anguineus*) may be some other species instead of *S. æquoreus*.

Family **MUGILIDÆ.**

66. Mugil cephalus (L). H. Κέφαλος $(_2)$.

Apost. 27 (*Mugil cephalus*), κέφαλος, † γοβύλι at Chalcis; at Missolonghi the males are called † στειράδια, the females † μπάφες.

Κέφαλος is common in Arist. See 543b 15, 567a 19, 570b 15, 591a 13–30, 602a 4, 1529b 17. The *κέφαλος*, according to Aristotle, is one kind of *κεστρεύς*. It begins to be pregnant in November or December and is pregnant thirty days; it has scales and is oviparous, feeds on mud or slime; like all the *κεστρεῖς* it is not carnivorous; these (the *κεστρεῖς*) are the only fishes which are not carnivorous, and have never been caught with any flesh in their stomachs. The fishermen never use flesh bait for them, but use barley-cake. The *κεστρεῖς* all feed on sea-weed and sand. The *κέφαλος*, which some call *χελών*, is a littoral fish. The *κέφαλοι* feed on mud, and for this reason they are heavy and slimy. The winter is beneficial to most fishes, but not so to the *κεστρεύς* and *κέφαλος*. The *κέφαλος* especially suffers from the rain and cold in winter. Their eyes become white and the fishes become blind and light in weight, and finally die. In the shallows at Nauplia and elsewhere many have been caught blind when there came severely cold weather. The eyes of many were white. Athen. vii, 77–79 under the heading *κεστρεύς* has many references to the *κέφαλος*, which is regarded as one kind of *κεστρεύς*. He says that Dorio in his work on fishes describes the marine division of the *κεστρεῖς* but does not consider the river *κεστρεύς*. He makes the kinds of marine *κεστρεύς* to be *κέφαλος* and *νῆστις*.

Hesychius, under the word *κέφαλοι*, says some of the *κεστρεῖς* are so called.

There is some confusion in regard to the relation of the *κέφαλοι* and *κεστρεῖς*, but in general the *κέφαλοι* are spoken of as a subdivision of the *κεστρεύς*. In some places, however, they seem to be distinguished from one another. *Κεστρεύς* seems to have been used in a double sense, at times in a broad sense including the *κέφαλοι*, and again in a more restricted sense.

67. Mugil capito (L). H. *Κέφαλος* (1).

Apost. 27 (*Mugil capito*), † *λαγιάδες* at Chalcis, † *βελάνισες* at Aitolico. For ancient use of *κέφαλος* v. sub. ***Mugil cephalus.*** A fish seems to have been called *λαγώς*, the hare, in ancient times, but I can find nothing definite about it. *Lepus marinus*, the sea hare, is very common in Pliny, where it is represented as exceedingly venomous. Vide Plin. 9, 155, 32, 9. The name most like *βελάνισες* are *βελόνη* and *βλέννος*. Of the latter Athen. vii, 29, says it resembles the *κωβιός* in appearance.

68. Mugil saliens (Risso).

Apost. 27 (*Mugil saliens*), † *μυξινάρι*, at Missolonghi and Chalcis. † *Κεφαλάδες* at Volo. For *κεφαλάδες* compare *κέφαλος*. † *Μυξινάρι* would be natural M. G. form of *μύξων*, found in A. G. writings. Arist. 570b 2, 543b 15. Written also *σμύξων*. The name is from *μύξα*, mucus, slime; usually the mucous discharge from the nose. According to Arist. the *χελών*, *σάργος*, (*σ*)*μύξων* and *κέφαλος* are different kinds of *κεστρεύς*. Athen. vii, 77, under *κεστρεύς*, has as one kind *μυξῖνος*. This is an inferior kind of *κεστρεύς*, the *κέφαλος* being best.

69. Mugil labeo (Cuvier).

Apost. 27 (*Mugil labeo*), † *γάστρος*. † *Πλαταρίδα* at Chalcis. *Γάστρος* is obviously from *γαστήρ*, belly, and may mean big-bellied fish.

70. Mugil chelo (Cuvier).

Apost. 27 (*Mugil chelo*), † *χελώνια*. Arist. 543b 15, 570b 2, 1529b 17 19, 591a 23.

Of the *κεστρεῖς*, says Aristotle, the *χελῶνες*, the *σάργος*, the one called *σμύξων* and the *κέφαλος* begin to be pregnant in December. The *κέφαλος*, which some call *χελών*, is littoral, but the *περαίας* is not.

See also Athen. vii, 77.

71. Mugil curtus (Yarrell).

Apost. 27 (*Mugil curtus*), called at Missolonghi † *μαυράκι*, black, when small, and † *λευκύνος*, white, when full grown. This is a doubtful species, unknown to us.

It seems evident that *Mugil* is the *κεστρεύς* of Aristotle and other A. G. writers, and that the *κέφαλος*, *μύξων* and *χελών* are species under this.

Family **ATHERINIDÆ.**

72. Atherina hepsetus (L).

Apost. 27 (*Atherina hepsetus*), *ἀϑερίνα*. Arist. mentions the *ἀϑερίνη* 570b 15 and 571a 6; also *ἀϑερῖνος*, 610b 6. He says it lays its eggs near the land, rubbing its belly on the sand. The *ἀϑερῖνοι* are gregarious, i. e. they go in shoals.

73. Atherina boyeri (Risso). H. *Ἀϑερίνα* ($_1$).

Apost, 28 (*Atherina boyeri*).

74. Atherina mochon (Cuvier & Val). H. *Ἀθερίνα* ($_1$).

Not noticed by Apostolides.

Family SPHYRÆNIDÆ.

75. Sphyræna sphyræna (L). H. *Λοῦτζος* ($_1$).

Apost. 28 (*Sphyræna spet*), *λοῦτζος* and † *σφύραινα*, the *σφύραινα* of Aristotle, 610b 5. The *σφύραινα* is gregarious.

Athen. vii, 122. The Attic Greeks call the *σφύραινα κέστρα*. Speusippus says that the *κέστρα* (or *σφύραινα*) *βελόνη* and *σαυρίς* are similar.

Family XIPHIIDÆ.

76. Xiphias gladius (L.)

Apost. 21 (*Xiphias gladius*), † *ξιφιός*. Hesychius gives *ξιφιός* as equal to *ξιφίας*. The name is derived from *ξίφος*, sword, and means sword-fish. For *ξιφίας* see Aristotle 1530a 17–21, 505b 18, 506b 16, 602a 26 30.

Arist. says of the *ξιφίας*: It has eight double gills on each side, and has the gall on the entrails; in the dog-days it has beside its fins a sort of little worm called *οἶστρος*, like a scorpion, as large as a spider. These cause them such pain that at times the *ξιφίας* leaps out of the water like the dolphin, and at times they even fall into boats.

Athen. vii, 96, says that Aristotle says: "The *ξιφίας* has the under part of its beak short but the upper part bony and large, equal to its whole size. This is called the sword (*ξίφος*), but the fish has no teeth."

Family ECHINEIDIDÆ.

77. Echeneis naucrates (L).

Apost. 22.

78. Remora remora (L).

Apost. 22 (*Echeneis remora*).

Family CORYPHÆNIDÆ.

79. Coryphæna hippurus (L.)

Apost. 21 (*Coryphæna hippurus*), † *λαμποῦγα*, † *μανάλια*.

Family TRICHIURIDÆ.

80. Trichiurus lepturus (L).

Apost. 22 (*Trichiurus lepturus*), † σπαθόφαρο, blade-fish.

81. Lepidopus caudatus (Euphrasen).

Apost. 22 (*Lepidopus argenteus*), † ἴλιος at Patras and † ἴλιακας at Corfu.

Family SCOMBRIDÆ.

82. Scomber scombrus (L).

Apost. 19 (*Scomber scomber*), σκουμβρί.

83. Scomber colias (Gmelin). H. Σκουμβρί ($_1$), σκομβρί ($_1$), * τσῆρος ($_1$).

Apost. 19 (*Scomber colias*), κολιός.

The specimen which I bought as κολιός got lost, so that although I secured the name I can not be sure of the species to which it was attached.

Arist. σκόμβρος, 610b 7, 597a 22, 571a 14, 571a 12, 599a 2. The σκόμβροι copulate about April and spawn about July or August. The weaker animals always migrate first at each extreme of heat or cold, the σκόμβροι before the θύννοι, and the quails before the cranes. Frequently when the south wind blows against the κολίαι and σκόμβροι as they are swimming out of the Black Sea, they are caught below more than about Byzantium. Κολίαι, σκόμβροι and πηλαμύδες run in schools. Athen. vii, 116. Hicesius says the σκόμβροι are less in size than the κολίαι, but more nutritious. Arist. κολίας, 610b 7, 543a 2, 598a 24. The most of the κολίαι do not migrate into the Pontus but pass the summer in the Propontis and spawn, while they pass the winter in the Aegæan. The κολίαι are caught when they are passing into the Propontis, and in smaller numbers as they pass out. They are best in the Propontis before they spawn. The σκόμβροι and κολίαι (are gregarious) go in schools.

Athen. iii, 92. The σάρδα is like the κολίας in size.

84. Gymnosarda alliterata (Rafinesque).

Apost. 19 (*Thynnus thynnina*), † τονίνα at Chalcis.

The tunny (θύννος, fem. θύννα and θυννίς), is probably mentioned oftener than any other fish in A. G. writers. Arist., θύννος, 488a 6, 505a 27, 591a 11, 537a 21 23, 543a 12, 571a 12 8, 607b 32, 607b 28, 599b 9 sq., 602a 31, 543a 1 b 3, 571a 15 14, 598b 19, 597a 22, 557a 27, 598a 18, 602a 26, 1531a 30, 844a 29. θυννίς, 591b 17, 610b 4, 1528b 6, 543a 9, 543b 12, 598a 26, 571a 10 15 18.

I glean the following points concerning the tunnies from Aristotle: The θύννοι are migratory and run in schools, are smooth, purely carnivorous, and have the net thrown around them sometimes while asleep; the female has a fin called ἀφαρεύς under the belly, but the male does not have it; they are at times burst by their fat. They live two years. The fishermen think this is proved by the fact that when the θυννίδες failed one year the θύννοι also failed the next year. They seem to be a year older than the πηλαμύδες. The θύννοι and σκόμβροι copulate about the first of April and spawn about the last of June or first of July. They lay their eggs in a sort of sack. The growth of the θυννίδες is rapid, When they spawn in the Pontus (Black Sea) there come from the eggs what some call σκορδύλαι, but the Byzantians αὐξίδες (growers), because they grow (αὐξάνω) in a few days. They go forth (out of the Pontus) in autumn with the θυννίδες, but return in the spring, being already πηλαμύδες.

An old θύννος has been caught whose weight was fifteen talents (1350 lbs.), and whose length was five cubits and a span (about 8 ft.). The old ones are not good even for salt fish. The θύννοι lie torpid in the depths of the sea in winter, and are plumpest after this hibernation. They begin to be caught about the beginning of summer (the rising of the Pleiades), and are caught last at the setting of Arcturus (winter solstice?). The θύννοι, most of all fishes, take pleasure in warmth and come to the sand near the land for the sake of the warmth, because they warm themselves and swim on the surface. They spawn in the Pontus (Black Sea) and nowhere else, and but once a year. The θύννος is good to eat again after Arcturus (probably the rising of Arct., about Sept. 15), for during this season it ceases to be afflicted with the οἶστρος, because of which pest it is inferior during the summer. The θύννοι and ξιφίαι are infested by the οἶστρος about the dog-days. At that time they both have by their fins a sort of little worm called οἶστρος, like a scorpion and as large as a spider (ἀράχνης). These cause them such pain that the ξιφίας leaps out of the water at times no less than the dolphin. The θυννίδες and πηλαμύδες enter the Pontus in spring and pass the summer there both for food and spawning. They come out straightway after the Pleiad (probably the setting of the Pleiades, about Nov. 10). If the wind is a southern one they swim out more slowly, but if northern more quickly, because the wind is then for wafting them on. They swim into the Pontus, keeping close to favorable the land on their *right*, but they swim out of it keeping close to the land on the *left.*[2] The σκόμϐροι are weaker than the θύννοι and migrate earlier. The θυννίς spawns in summer about the month Hecatombæon near the vernal equinox. It lays a sort of sack filled with many small eggs.

The above are, so far as I can make out, the main points which Aristotle reports concerning the θύννοι and θυννίδες. Whether they are the same, the latter merely referring to the females, is not altogether clear. It will be noted that some of the above statements are obscure and others contradictory, at least apparently so.

85. Albacora thynnus (L).

Apost. 19 (*Thynnus thynnus*), μαϊάτικο. † Γόφος at Leucas, † γλουπέας at Zante. Μαϊάτικο means May (-fish). I saw this fish in the market at Athens and heard this name, but the fish was too large to take a specimen of it, the specimens which I saw being, if my memory serves me right, some five or six feet long.

86. Gymnosarda pelamys (L).

Apost. 19 (*Thynnus brachypterus*), † ὀρκύνος and † κόπανος in the Gulf of Volo. Κόπανος = a knocker, pounder, pestle. Aristotle has ὀρκύνες (ὀρκύς), 543b 5. He says they spawn in the open sea.

Athen. vii, 98, has ὄρκυνος as name of a fish. "Dorio, in his work on fishes, says that the ὄρκυνοι crossing over from the sea about the Pillars of Hercules come into our waters, wherefore most are caught in the Spanish and Tyrrhenian Seas (the sea west of Italy was called Tyrrhenian). From there they scatter throughout the rest of the (Mediterranean) sea. Hicesius says that those caught at Gadeira (Gades, Spain) are fattest, and next to these, those caught in Sicily; but those which are far from the Pillars of Hercules are poor, because they have swum for a greater distance." Aelian, Nat. An. i, 40, speaks of the ὄρκυνος as a monstrous (κητώδης) fish very skilful in getting the hook out of its mouth when caught. According to Sostratus, Athen. vii, 66, the ὄρκυνος is simply a θύννος grown very large. So also Archestratus, Athen. vii, 63.

87. Sarda sarda (L). H. *Παλαμύδα* $(_1)$.

Apost. 19 (*Pelamys sarda*), παλαμύδα. Aristotle has the name πηλαμύς,—ύδος. 488a 6, 610b 6, 543a 1, 543b 2, 598a 26, 571a 19,

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[2] Probably meaning on what is their left as they go in; for he proceeds to say that some persons assigned as the reason for this that they have keener vision in the right eye than the left, implying that they always keep the right eye towards the land.

571a 11. The *πηλαμύδες* are migratory and run in schools. The *πηλαμύδες*, *θυννίδες* and *ἀμίαι* run into the Pontus (Black Sea) in the spring and pass the summer there, spawning about the mouths of streams. The young of the *θυννίδες* are of rapid growth. In the autumn they go out of the Pontus with the *θυννίδες* and are then called *σκορδύλαι* (or *αὐξίδες*). The next spring they return, being already grown to be *πηλαμύδες*.

The general belief of the fishermen from whom Aristotle derived his information seems to have been that the *πηλαμύδες* were simply half-grown tunnies. The first year they were *σκορδύλαι*, the second year *πηλαμύδες* and the third year *θυννίδες* or *θύννοι*. Athen. vii, 66, reports that Sostratus says the *πηλαμύς* is called *θυννίς*, and when it gets larger *θύννος*, and still larger *ὄρκυνος*. Cf. Strabo 549, *κορδύλη*, *θύννη*, *πηλαμύς*. Pliny, 9, 47.

Family **CARANGIDÆ.**

88. Trachurus trachurus (L). H. * *Κοκάλι* $(_1)$.

Apost. 19 (*Trachurus trachurus*), *σαυρίδι*. *Κοκάλι* in M. G.means *bone* or *little bone*. Arist. (528a 9, 761a 21) uses *κοκάλιον* as name of the snail. For *σαυρίδι* see under *Trachurus mediterraneus.*

89. Trachurus mediterraneus (Stemdachus). H. *Σαυρίδι* $(_2)$, * *σαμπανιός* $(_1)$.

Not distinguished by Apostolides. *Σαῦρος* = lizard, is used as name of a fish by Aristotle 610b 5. It is gregarious. In Athen. vii, 120, the name is given as that of a fish, and it is substantiated by several quotations, but nothing is given which would help to identify the fish. Athen. vii, 122, says Speusippus represents the *κέστρα*, *Βελόνη* and *σαυρίς* (acc. *σαυρίδα*) as similar. *Σαυρίδι* is a regular M. G. form of *σαῦρος*.

90. Decapterus suareus (Risso). H. * *Κοκάλι* $(_1)$.

Apost. 20 (*Caranx suareus*), *σαυρίδι κυνηγός*, hunter *σαυρίδι*.

91. Naucrates ductor (L).

Apost. 20 (*Naucrates ductor*), † *κουλαγοῦζος*.

92. Lichia glauca (L). H. *Λίτσα* $(_1)$.

Apost. 20 (*Lichia glaucus*), *λίτσα*.

93. Lichia amia (L).

Apost. 20 (*Lichia amia*), † *γκιφάρι*, † *γουφάρι*, † *γομφαρί*, † *λουφάρι*. *Γόμφος* (a bolt, pin or spike) and its diminutive *γομφάριον* were ancient names for a fish. They are found in Tzetzes and Oppian or their scholia. See L. & S. under the words. Compare *γοφάρι, *Pomatomus saltatrix.*

94. Lichia vadigo (Risso).

Apost. 20.

Family POMATOMIDÆ.

95. Pomatomus saltatrix (L). H. **Γοφάρι* $(_1)$.

The common Blue-fish of America; not noticed by Apostolides. This name is probably the same as γουφάρι reported by Apost. 20 as common name for *Lichia amia,* where see. The man who sold me the specimen probably did not distinguish it from *Lichia amia.*

The names are no doubt shortened from γομφάριον, a diminutive of γόμφος. This is proved by the existence of γομφάρι as a parallel form (see *Lichia amia*). Both γόμφος and γομφάριον occur in Tzetzes and Oppian (or their scholia) as the name of a fish.

L. & S. give γομφάριον = κεστρεύς and refer to Tzetzes ad Lycophronem 664, and Schol. Oppian H. 1, 112, 3, 339, and a gloss, γόμφος ἰχθύς. Γόμφος means a bolt, pin or spike.

Both γόμφος and its diminutive γομφάριον were clearly used as names of a fish or fishes; but the authority of Tzetzes, a Byzantine Greek of the Twelfth Century, A. D., or of a late scholiast on Oppian is not sufficient to prove that it meant κεστρεύς.

Family ZENIDÆ.

96. Zeus faber (L). H. *Σαμπχέρο* $(_1)$.

Apost. 21 (*Zeus faber*), σανπιέρος, σαινπιέρης, † χριστόψαρο (Christ-fish). The first three forms of the common Greek name seem to be corruptions of the French or Italian for Saint Peter.

97. Zeus pungio (Cuv. & Val).

Apost. 21.

98. Capros aper (L).

Apost. 21.

Family STROMATEIDÆ.

99. Stromateus fiatola (L).

Apost. 21.

Family CEPOLIDÆ.

100. Cepola tænia (L). H. *κροσταλῆδα ($_1$).

Apost. 22 (*Cepola rubescens*), † τσίπουλα.

The name *Cepola tœnia* has priority over *C. rubescens*. J.

Family TRACHYPTERIDÆ.

101. Trachypterus spinolæ (Cuv. & Val).

Apost. 23.

102. Trachypterus trachypterus (L).

Apost. 23 (*Trachypterus falx*).

Family SERRANIDÆ.

103. Dicentrarchus labrax (L). H. Λαβράκι ($_1$).

Apost. 17 (*Labrax lupus*), λαβράκι (for all species of this genus).

Aristotle λάβραξ 489b 26, 534a 9, 537a 27, 543a 1 b 11, 567a 19, 570b 20, 591a 11 b 18, 601b 29–31, 607b 26, 610b 10, 1530a 1–4.

The λάβραξ has scales and is oviparous, as all fishes with scales are, is carnivorous, has two fins on its back and two on its belly, has an especially acute sense of hearing, is often speared in day-time while sleeping, spawns twice a year, once in summer and once in winter, spawns chiefly "where rivers flow," has a stone in its head, and in consequence of this is especially apt to suffer in winter, being frozen to death and cast ashore. They are not good for food when pregnant. The labrax and cestreus, although most hostile to one another, flock together at certain seasons. For frequently not only those of the same species flock together but also those whose food is the same or similar, if it is plenty. Athenaeus, vii, 86. The *labrax* has a tongue that is bony and grown fast, and a triangular heart. It is the most intelligent of fishes, being quick to see a means of escape. Its name is derived from λάβρος, violent, greedy.

104. Dicentrarchus punctatus Bloch.

Apost. 17 (*Labrax punctatus* and *L. lupaster*).

105. Serranus scriba (L). H. Πέρκα ($_3$).

Apost. 17 (*Serranus scriba*), πέρκαι.

Aristotle πέρκη, 505a 16, 508b 17, 568a 20 22, 599b 8, 1528a 12. According to Aristotle the πέρκη has four gills on a side, double except the last, just as is true also in case of the κίχλη, γλάνις and κυπρῖνος. It has many pyloric appendages, spawns in the stagnant parts of rivers and lakes, among the reeds; the eggs cling together in a large bunch and the fishermen gather them by unwinding them from the reeds.

The κίχλαι, κόττυφοι and πέρκαι are given as πετραῖοι, or rock-fishes, and are said to hibernate and nest in pairs.

Athen. iv, 13. "Flowery-colored πέρκη." Vii, 110. Speusippus says that the πέρκη, χάννα and φυκίς are similar. Epicharmus calls them "gleaming." There was a proverb "The πέρκη follows the μελάνουρος." Aristotle says that the φυκίς is thorn-crowned and variegated in color, but the πέρκη belongs to those which are adorned with lines and have bands on their sides.

106. Serranus cabrilla (L.) H. *Χάνος* ($_2$).

Apost. 17 (*Serranus cabrilla*), χάνος. Cf. χάννα and χάννη. Aristotle 598a 13, 591a 10 b 6, 1528a 15, 538a 19 21, 567a 27, 755b 21, 760a 9. Most of the fishes are male and female, but concerning the ἐρυθρῖνος and χάννη there is a doubt, for all of these which are caught have eggs in them. The χάνναι are purely carnivorous; they often throw out their stomachs (κοιλίας) when pursuing the smaller fishes, because the stomachs of fishes are near to their mouths and they have no gullet (στόμαχος). The χάννη is pelagic. Athen. vii, 134. Epicharmus in the Marriage of Hebe says: "Wide-gaping χάνναι and monstrous-bellied ὄνοι." Aristotle calls it (the χάννη), variegated with black and red (or salmon) and adorned with lines, because it is adorned with dark lines.

The names χάνος and χάννη mean the gaper, √ χαν, to gape.

107. Paracentròpristis hepatus (L). H. * *Καψομοῦλα* ($_1$).

Apost. 17 (*Serranus hepatus*), πέρκα.

108. Mycteroperca rubra (Bloch). H. * *Μοσκακτάποδο* ($_1$).

Not noticed by Apostolides.

109. Epinephelus gigas (Brünnich.) H. *Ῥοφός* ($_1$).

Apost. 18 (*Epinephelus gigas*), ροφός and † ὀρφώς. Aristotle 591a 11, 598a 10, 599b 6, 543b 1, 1530b 27. Aristotle has the forms ὀρφός and ὀρφώς. According to him this fish is of very rapid growth, is littoral, lies torpid for a season (in winter), and is purely carnivorous.

Aristophanes, Wasps, 493, speaks of the ὀρφοί as found in the markets of Athens.

Athen. vii, 97, *ὀρφώς* and *ὀρφός*. It is sharp-toothed and solitary. It is a peculiarity of it that the seminal ducts are not found in it and that it can live a long time after it is cut up. It is one of those which lie torpid during the stormiest days, and is more fond of being near land than out in the open sea. Numenius calls it the *very rough ὀρφός*. Cf. also Athen. viii, 51.

Aelian Nat. An. v, 18, says: The *ὀρφώς* is a sea fish, and if you should catch one and cut it up you would not see it dead immediately, but it still partakes of motion, and for no little time. They like to stay in holes throughout the winter. Cf. also Ael. Nat. An. xii, 1.

110. Epinephelus chrysotænia (Doderlein). H. *Στήρα* ($_1$)

Not seen by Apostolides. Cf. Apost. 17, *Polyprion cernium.*

111. Polyprion cernium (Cuvier).

Apost. 17, *στήρα.*

112. Anthias anthias (L).

Apost. 18 (*Anthias sacer*).

Family **APOGONIDÆ.**

113. Apogon imberbis (L). H. *Καλογρίτσα* ($_1$).

Apostolides 18 (*Apogon imberbis*). Cf. Apostolides 27, *Chromis castanea.*

Family **SPARIDÆ.**

114. Diplodus vulgaris (Geoffrey St. Hilaire). H. *Σαργός* ($_1$), * *σκαρογάϊδαρο,* ($_1$), * *ἀβλιάς* ($_1$), *σπάρος* ($_1$).

Apost. 23 (*Sargus vulgaris*), *σαργός*, † *χαρακίδα.* Aristotle *σάργος* (or v. l. *σαργός*), 543b 14 15 16, 570a 32 b 1 3, 543a 7 b 8, 591b 19 21, 1528a 24.

The *σάργος* spawns twice a year, in spring and in autumn; it is pregnant about thirty days in the month of December. The *σάργος*, *χελών*, *κέφαλος* and *σμύξων* (or *μύξων*) are different kinds of *κεστρεῖς*, i. e. sub-classes of the *κεστρεύς*. The *σάργος* feeds after the *τρίγλη*. The *σαργῖνοι* (sargus-like fishes ?) run in schools. Athen. vii, 93, says that Aristotle says the spotted-tailed fishes are *μελάνουρος* and *σάργος*, and they are much lined and dark-lined. Num. in Hal. says: " To land, a *σαργός*, most ' line-jerking ' of fishes." Lat. *sargus.* Plin. 9, 65 and 162. Ov. Hal. 105. *Σκάρος* and *σπάρος* are also found in Aristotle. Vide sub *S. rondeletti* and *S. vetula*, Apostolides 23.

Σκαρογάϊδαρο is compounded of *σκάρος* and M. G. *γάϊδαρο*, donkey, and means *scarus-donkey.*

115. Diplodus sargus (Gmelin).

Apost. 23 (*Sargus rondeletti*), *σπάρος*.

The specimen sold me as *σπάρος* was *Diplodus vulgaris.* I am inclined to think that the names *σαργός*, *σκάρος* and *σπάρος* are used indiscriminately for any and all species of *Diplodus.*

Aristotle, 508b 17, has *σπάρος*, but a *vario lectio* is *σκάρος*. He says the *σπάρος* (or *σκάρος* if we follow the other reading) has many pyloric appendages. Athen. vii, 114, mentions the *σπάρος* and cites several passages from ancient writers in which the *σπάρος* is named. One is from Epicharmus, in which *σπάρος* can not be a mistake for *σκάρος*, as both names occur connected by and, viz., "We fished for *σπάροι* and *σκάροι*." Cf. also Athen. vii, 52.

116. Diplodus vetula (Cuv. & Val.).

Apost. 23 (*Sargus vetula*), † *σκάρος* cf. *σκαρογάϊδαρο*, *D. vulgaris.*

Σκάρος is common in ancient writers. Arist. 1531a 28, 621b 16, 1531a 10–17, 505a 28, 662a 7, 505a 14, 508b 11, 591a 14, 508b 12 17, 591b 22, 675a 3, 1528a 32, 621b 15.

According to Aristotle the *σκάρος* has two gills on each side, one single and the other double, has its stomach shaped exactly like an intestine, seems to ruminate just as the quadrupeds do, is a bony fish, is the only fish whose teeth are not sharp and pointed, and is consequently with good reason held to be the only one that ruminates.

Athen. vii, 113, under *σκάρος*, quotes Aristotle as saying that it is (not) sharp-toothed, and solitary and carnivorous; it has a small mouth and tongue, not grown fast much, etc. A passage plainly corrupt. To make any sense out of it at all we must assume that the negative near the beginning of the quotation has dropped out, and replace it. Otherwise it contradicts what Aristotle has repeatedly said elsewhere, and even contradicts the latter part of the passage itself, where it is said that the *σκάρος* is fond of seaweed and is baited with this.

The statement that the *σκάρος* chews its cud is made repeatedly in Aristotle and other ancient writers.

Nicander of Thyatira says there are two kinds of *σκάροι*, one of which is called *ὀνίας*, donkey-colored, the other *αἴολος*, brilliant.

This suggests *σκαρογάϊδαρο*, 'scarus-donkey,' a name given to one of my specimens of *Diplodus vulgaris*. Moreover the names secured by me under *D. vulgaris* indicate that at the present time the names *σκάρος*, *σπάρος* and *σάργος* are all used more or less indiscriminately for all the species of *Diplodus*.

Scarus is frequent in Latin writers. Plin. 9, 62. Ov. Hal. 9, 119. Hor. Sat. 2, 2, 22, etc.

117. Diplodus annularis (L).

Apostolides 23 (*Sargus annularis*), † *σουϐλομίτης* at Corfu. *Σοῦϐλα* (or *σουϐλί*) = awl, spit (for roasting meat). *Μίτος* = thread. The resemblance to a derivation from these words may be accidental.

118. Charax puntazzo (Gmelin). H. *Οὔγαινα* $(_1)$.

Apost. 23 (*Charax puntazzo*), *οὔγαινα, οὔαινα.*

119. Pagellus erythrinus (L). H. *Λυθρίνι* $(_1)$, * *μπαλάς* $(_1)$.

Apost. 23 (*Pagellus erythrinus*), *λυθρίνι, λυθρινάρι.* For name *λυθρίνι* see under *Sparus pagrus.*

120. Pagellus acarne (Cuvier). H. * *Μούσμουλα* $(_1)$, *μουρμούρα* $(_1)$.

Apost. 24 (*Pagellus breviceps*).

121. Pagellus mormyrus (L). H. *Μουρμούρα* $(_2)$.

Apost. 24 (*Pagellus mormyrus*), *μουρμούρα.* A. G. *μόρμυρος.* Aristotle 570b 20.

Cf. Athen. vii, 94. Oppian, Hal. 1, 100, Latin *mormyr.* Ovid, Hal. 110. Plin. 32, 152. Ovid speaks of *Pictœ mormyres*, painted mormyrs.

There is frequent mention of the name, but apparently nothing that would help in identifying it.

122. Pagellus centrodontus (De La Roche).

Apost. 24.

123. Sparus pagrus (L). H. *Φαγγρί* $(_2)$, *λυθρίνι* $(_1)$.

Apost. 24 (*Pagrus vulgaris* and *Pagrus orphus*), † *μερτζάνι*, a Turkish word equivalent to the Greek *ἐρύθρινος*. Apostolides gives *φαγγρί* as common name for *Dentex macropthalmus*, and *λυθρίνι* for *Pagellus erythrinus*. *Φαγγρί* may be M. G. equivalent for A. G.

φάγρος. Aristotle 598a 13, 601b 30, 1529a 41, 1531a 37. The *φάγρος* alternates between the open sea and near the shore, has a stone in its head, and consequently suffers much in winter, is carnivorous, solitary, has a triangular heart, and is at its prime in spring.

Athen. vii, 133. Speusippus, in the second book of his "Resemblances," says the *φάγρος*, *ἐρυθρῖνος* and *ἥπατος* are similar.

Latin *Phager*, *phagrus*, *pager*, *pagrus;* hence, Spanish *Pargo*, English *Porgy*, corrupted to *Pogy*. Plin. 32, 150, 9, 57, 32, 113. Ovid. Hal. 107. See Bonitz's Index to Aristotle s. v. *ἐρυθρῖνος*, fin.

Under one of my specimens I noted that the tips of scales and ends of fins and tail were crimson.

Λυθρίνι is undoubtedly M. G. form of *ἐρυθρῖνος*. *Λυθρίνι* or *λυθρινάρι* (Apostolides, bottom of p. 23) = *ἐλυθρίνιον* or *ἐλυθρινάριον*, diminutive of *ἐλυθρῖνος* = *ἐρυθρῖνος*. The only possible question is on the last equation. The interchange of the liquids *l* and *r* is, however, a quite common phonetic phenomenon, though not, so far as I know, occurring elsewhere in passing from A. G. to M. G. Perhaps *λύθρον*, gore, is from *ἐρυθρός* and M. G. *λυθριάζω* = *ἐρυθριάζω*.

The fish *ἐρυθρῖνος* is frequently mentioned in Aristotle.

Aristotle, 538a 19–21, 567a 27, 598a 13, 741a 36,750b 30, 755b 20, 760a 8, 1511b 37, 1528b 1, 1529a 39.

According to Aristotle the *ἐρυθρῖνος* is a pelagic fish, and of both it and the *χάννη* the male had never been seen. He says the most of the fishes are male and female, but concerning the *ἐρυθρῖνος* and *χάννη* there is a doubt, for all which are caught have eggs in them. Again he says of those called *ἐρυθρῖνοι* no male has ever been seen, but only females, and these full of eggs. But we have not yet trustworthy observation on this point.

The name means red or reddish, and the color of the fish must have justified the name.

124. Sparus aurata (L). H. *Τσιππούρα* $(_1)$.

Apost. 24 (*Chrysophrys aurata* and *Chr. crassirostris*), † *χρυσόφα*, *τσιππούρα*, † *χότσα* at Corfu, *μαρίδα* at Missolonghi. *Τσιππούρα* resembles somewhat the A. G. *ἵππουρος*, horse-tail, which Aristotle says has the most rapid growth of any fish. See Aristotle 543a 21 23, 599b 3. According to Cont. Lex. *τσίπουρα* is a

M. G. name for the refuse of grapes when the juice has been pressed out. For *μαρίδα* see *Smaris*.

Χρυσόφα is perhaps the A. G. *χρύσοφρυς*. Aristotle 598a 10, 591b 9, 489b 26, 508b 20 21, 543b 3, 570a 20, 598a 21, 537a 28, 599b 33, 602a 11. The *χρύσοφρυς* (literally "golden brow") has two fins on its back and two on its belly, has few pyloric appendages, one more and another fewer, is frequently speared in the day-time while sleeping, spawns chiefly where rivers flow, spawns in the summer, is littoral, is found in the lagoons of the sea, hibernates and suffers in winter.

Athen. iv, 13. Matro says: The *χρύσοφρυς*, which is the most beautiful among all fishes. Athen. vii, 136. A large and favorite food fish.

125. Spondyliosoma cantharus (Gmelin). H. * *Σκαθάρι* $(_1)$.

Apost. 24 (*Cantharus griseus* and *C. brama*), † *ἀσκάθαρος*, † *βαγιοῦνο* in Corfu. *Σκαθάρι* is the common name for *Cantharus* among the men of the fish market. This is a clipped diminutive from *σκάθαρος*, *σκαθάρι(ον)*. Such diminutives are exceedingly common in the colloquial language of modern Greece, being diminutives in form only, and not in meaning.

In modern Greek *σκάθαρος* and *σκάνθαρος* means a beetle, just as ancient *κάνθαρος* (see Contopoulos Lex. s. v.). So also M. G. *σκάθαρος*, no doubt, equals ancient *κάνθαρος* as name of a fish. For initial *σ* cf. (*Σ*)*κάμανδρος* and (*σ*)*κέπαρνον* in Hom. where the fact that a short vowel is not read long before these words shows that they originally lacked the initial *σ*. Cf. also *κάπετος* for *σκάπετος*, *κνίψ* and *σκνίψ*, *κόνις* and M. G. *σκόνη*, *κύπτω* and M. G. *σκύπτω*, etc. Forms with and without initial *ς* before *μ* are common, as *μικρός* and *σμικρός*, *μῖλαξ* and *σμῖλαξ*, etc. For omission of the nasal before a mute cf. *γομφάρι* and *γοφάρι*.

Arist. 598a 10, speaks of the *κάνθαρος* as a littoral fish of solid flesh. According to Oppian it delights in rough rocks, Op. Hal. iii, 340.

126. Spondyliosoma orbiculare (Cuv. & Val.). H. * *Σκαθάρι* $(_2)$, * *σκάθαρος* $(_1)$.

Apost. 24 (*Cantharus orbicularis*). *Σκαθάρι* = A. G. *κάνθαρος*. See under *Spondyliosoma cantharus*.

127. Scatharus græcus (Cuv. & Val). H. *Σκαθάρι* $(_1)$.

Not noticed by Apostolides.

128. Box boops (L.). H. *Γόπα* $(_1)$.

Apost. 23 (*Box boops*), † *βῶπα* and *γοῦπα*. *Βῶξ* or *βόαξ*, now used as scientific name for this genus occurs in Aristotle 610b 4, 1528a 20. He says that they are found in schools. Those (?) marked on the back (*νωτόγραπτα*) are called *βῶξ*, but those marked obliquely (*σκολιόγραπτα*) are called *κολίας* (*σκολίας*). See Athenaeus vii, 27, where a number of references to the *βῶξ* are given from different authors. It was a favorite food fish. Athenaeus derives its name *βόαξ* from the word *βοή*, a cry or shout, and defends this form of the name and derivation against Aristophanes of Byzantium, who says: "We wrongly call the fish *βῶκα* (*βῶξ*), and ought to call it *βόωπα* (*βόωψ*), since being a little fish it has large eyes. It should be *βόωψ* = having the eyes of an ox." *βόωψ* is compounded of *βοῦς*, stem, *βο*(F) and *ὦψ*, and appears in Homer in the feminine form *βοῶπις* as a common epithet of Hera. The word means ox-eyed, large-eyed. If this is the fish now called *βῶπα* the authority of Aristophanes of Byzantium prevailed. At any rate, the *βῶξ* was a *small fish* with *large eyes*, having peculiar *markings on its back*, running *in shoals*, and admired by epicures.

129. Boops salpa (L). H. *Σάλπα* $(_1)$, *γόπα* $(_1)$.

Apost. 23 (*Box salpa*), *σάλπα*. Aristotle *σάλπη*. 1528a 4, 1531a 1 2 3, 534a 9, 621b 7, 598a 20, 570b 17, 543a 8, 543b 8.

The *σάλπη* has an especially acute sense of hearing, is enticed by malodorous bait such as dung, spawns in autumn in some places, but in most places in the beginning of summer, feeds on dung and seaweed, may be caught with pumpkin, spawns in the lagoons of the sea, is not carnivorous; it is much lined and red-lined, i. e. marked by many red (orange ?) lines, has jagged teeth, and is solitary; it is best in harvest time. Athen. vii, 118. The *σάλπη* is variegated in color. Whence Mnaseas, who compiled the work entitled "Sports," was called *Σάλπη* by his acquaintances on account of the brilliant variety of the collection. There is a similar fish in the Red Sea called *στρωματεύς*, having golden bands extending across all its body as Philo reports in his "Metallicon."

130. Oblada melanura (L). H. *Μελανοῦρι* $(_1)$.

Apost. 23 (*Oblada melanura*), *μελανοῦρι*, black-tail. Aristotle 591a 15, 1528a 24, 1511b 37, 1512a 3, *μελάνουρος*. It feeds on sea-weed. The μελάνουρος and σαργός are spotted on their tails (have a spot on their tails), and are much lined and dark-lined. Athen. vii, 93. Hicesius says it is like the σαργός.

Epicharmus mentions together σαργίνοι and μελάνουροι. Latin *Melanurus*, Ennius, Ovid., Plin., etc. Op. Hal. 1, 98.

There are many references which mention the μελάνουρος, but they add nothing to our knowledge of it. The meaning of the name so well describing the fish, and the fact that it is still in common use for this species establish its identity.

131. Dentex dentex (L). H. *Συναγρίδα* $(_2)$.

Apost. 24 (*Dentex vulgaris*), συναγρίδα. Aristotle συναγρίς (gen. συναγρίδος, acc. συναγρίδα). 505a 15, 506b 16. The συναγρίς has four single gills on each side, and the gall bladder on the entrails. Athen. vii, 121, συναγρίδες. Epicharmus mentions these in "Marriage of Hebe" and "Land and Sea."

132. Dentex macrophthalmus (Bloch).

Apost. 24 (*Dentex macrophthalmus*), φαγγρί. Cf. *Sparus pagrus.*

133. Mæna mæna (L).

Apost. 24 25 (*Mœna vulgaris, Osbeckii* and *Jusculum*, the two latter doubtful species).

134. Spicara smaris (L). H. *Μαρίδα* $(_1)$, * *μαίνουλα* $(_1)$, * *ξενουλα* (?) $(_1)$; * *μέλωνα* $(_1)$.

Apost. 25 (*Smaris vulgaris* and *Chrysalis*), † σμαρίς, † μαρίς. In M. G. αι = ε, so that μαίνουλα (μένουλα), ξένουλα and μέλωνα (μέλουνα) are evidently all modifications of the same name. *Μαρίδα* is the regular M. G. equivalent for A. G. μαρίς or σμαρίς. *Μαίνουλα* suggests μαινίς, found in Aristotle as name of a fish. 610b 4, 607b 10–21, 570b 15–30, 569b 28, 1529a 7, 607b 10. The μαινίς spawns after the winter solstice and is the most prolific of fishes. It is good when pregnant. The form of the female is rounder, that of the male longer and flatter. When the female is beginning to be pregnant the male is black and variegated in color. At this time they are called τράγοι (he-goats) by some. They run in schools. Σμαρίς, Aristotle 607b 22. The σμαρίς changes its color in like manner with the μαινίς, being lighter in winter and darker in summer. This is most evident around the fins and gills.

Op. Hal. 1, 109. Along the sedgy shore beneath the green plants feed *μαινίδες, τράγοι, ἀθερῖναι, σμαρίδες* and *βλέννος*, etc.

Epichar., frag. 35; Athen., vii, 92 and 137.

Speusippus says that the *βόαξ* and *σμαρίς* are like the *μαινίς*.

135. Spicara alcedo (Risso). H. * *Ζέρρουλλα.*

Apost. 25 (*Smaris alcedo*).

136. Centracanthus cirrus (Rafinesque).

Apost. 25 (*Smaris maurii*).

Family **PERCIDÆ.**

137. Perca fluviatilis (L).

Apost. 17 (*Perca fluviatilis*), † *πέστροφα.*

Family **MULLIDÆ.**

138. Mullus surmuletus (L). H. *Μπαρμπούνι* (Barbouni) ($_2$).

Apost. 15 (*Mullus surmulletus*) † *τρίγλες, μπαρϐούνι, πετρόψαρο,* † *τσιγαρόλια.*

Apostolides identifies this with the ancient *τρίγλη*. Aristotle 1531a 26, 598a 10–21, 570b 22, 610b 5, 1531a 32, 621b 7, 1531a 32–33, 591a 12, 508b 17, 591b 19, 557a 26, 1531a 34, 621b 21, 1511b 39, 1512a 3, 570b 22–25, 543a 5, 1531a 24 33.

According to Apostolides the names *τρίγλες* and *μπαρμπούνι* are common to all species of the *Mullus*. *Μπαρμπούνι* is an Italian name. The same fish is common in both Italian and Greek markets under this same name. It is perhaps the same as the fish which the Romans called *Barbus*. Ans. Morell., 94, 134, cf. Cic. Par. 5, 2, 38, *Barbatulus mullus*, and id. Att. 2, 1, 7, *Barbati mulli*, bearded mullets.

According to Aristotle the *τρίγλη* (or *τρίγλα*) has many pyloric appendages, is the only fish that breeds three times a year, is especially infested with fish lice, feeds on sea-weed, shell-fish and mud; it lives near the shore, is found in the lagoons, runs in schools and eats flesh, but is not exclusively carnivorous.

Athen. vii, 125. The *τρίγλη* is sharp-toothed, gregarious, all spotted (?), and moreover carnivorous. When it has produced young (spawned) three times it is barren, for it gets little worms in its uterus which devour the eggs (or young *γόνος*). Speusippus says the *κόκκυξ, χελιδών* and *τρίγλη* are similar. They are called red-colored and yellow-colored.

Athenaeus gives many other references to the *τρίγλη*, but apparently they throw no light upon the identification of the fish.

139. Mullus barbatus (L).

Apost. 15 (*Mullus barbatus*), † *κεφαλάδες* at Chalcis.

140. Mullus fuscatus (Rafinesque).

Apost. 15.

Family SCIÆNIDÆ.

141. Umbrina cirrosa (L).

Apost. 18 (*Umbrina cirrosa*), *σκιός*, Cf. *Corvina nigra* = *Sciaena umbra.*

Aristotle has *σκίαινα* 601b 30. He says: "Those fish which have a stone in the head, as *χρόμις*, *λάβραξ*, *σκίαινα* and *φάγρος* suffer most in the winter. Athen. vii, 121, shows that the *σκίαινα* was also called *σκιαθίς* by Epicharmus and *σκιαδεύς* by Numenius.

Latin *Sciaena* and *Sciadeus* for the female and male respectively. Plin. 32, 151. *Σκιός* and *σκίαινα* both seem to be from *σκιά*, shadow; Latin, *Umbra.*

142. Sciæna aquila (Lac.).

Apost. 18 (*Sciæna aquila*), *μυλοκόπι*, † *κρανιός* at Chalcis.

143. Sciæna umbra (L). H. *Μυλοκόπι* ($_1$), * *σαραβάνο* ($_1$), *σκιός* ($_1$).

Apost. 18, 19 (*Corvina nigra*), † *σκιὸς καλιακούδα*. According to Apostolides *μυλοκόπι* is common name for *Sciæna aquila*. For *σκιός* see *Umbrina cirrosa*, Apost. 18.

Family LABRIDÆ.

144. Labrus bergylta (Ascanius).

Apost. 25 (*Labrus bergylta*), *χελούδισες*, *χεῖλος*, *χειλοῦ*, † *φυκόψαρο* and *πετρόψαρο* M. G. names for the *Labrus*. *Φυκόψαρο*, = *φῦκος*-fish, may be referred to A. G. *φύκης* and *φυκίς*. The names are manifestly from *φῦκος*, sea-weed. Aristotle 567b 20 19, 591b 16, 607b 20, 1528a 10, 607b 18, 591b 13.

The small *φυκίδες* spawn twice a year, the male (*φύκης*) differs from the female (*φύκις*) by being darker and having larger scales. They feed upon the sea-weed (*φῦκος*), eat no flesh except that of the *καρίδες* (shrimps), change their color, being variegated in the spring but white during the rest of the year, and are the only sea-fishes which make a nest and lay their eggs in the nest. It is a small fish, one of the rock-fish (*πετραῖοι*; observe M. G. name *πετρόψαρο*), crowned with spines, belongs to the *πετραῖοι* which are called soft-fleshed, such as the *κόσσυφοι, κίχλαι, πέρκαι, κώβιοι*, etc. For *χειλοῦ*, etc., see *Crenilabrus pavo.*

145. Labrus livens (L.) H. *Λάμπρινα* ($_1$).

Apost. 25 (*Labrus merula*).

146. Labrus viridis (L). H. *Πετρόψαρο* ($_1$), * *σουλουμπαρδός* ($_1$).

Apost. 25 (*Labrus viridis, etc.*). According to Apostolides all species of the genus *Labrus* are called by the names *χελούδισες, χεῖλος, χειλοῦ, φυκόψαρο* and *πετρόψαρο.*

147. Labrus bimaculatus (L.)

Apost. 25 (*Labrus mixtus*, etc.).

148. Symphodus ocellaris (L). H. * *Καβώρας* ($_1$), * *σφίγγα* ($_1$), sphinx.

Apost. 25 (*Crenilabrus roissali*).

149. Symphodus ocellatus (Forskål).

Apost. 25 (*Crenilabrus ocellatus*).

150. Symphodus mediterraneus (L). H. * *Σελήνη* ($_1$).

Apost. 26 (*Crenilabrus mediterraneus*). I can not find *σελήνη*, moon, given as name of a fish in any book, ancient or modern. The nearest approach is *σουλῆνα*, given by Cont. Lex. as common name of the bivalve *Ensis siliqua*, called razor-fish and spout-fish in English according to the Cent. Dictionary. The word *σουλῆνα* also means spout-fish, being from ancient *σωλήν*, a spout or gutter.

This name is used by the ancients as name of a bivalve, and this is no doubt the same as is now called *σουλῆνα.* See Aristotle 683b 17, 528a 17 22, 548a 5, etc.

151. Symphodus tinca (L). H. * *Χειλοῦσα* ($_2$), *χειλοῦ* ($_1$).

Apost. 26 (*Crenilabrus pavo*), † *λήπαινα*, † *λαπίνα μαύρη* (black) and *μεγάλη* at Chalcis.

Χεῖλος means lip, Latin *labrum*, whence the name *Labrus.* Apostolides gives *χεῖλος* and *χειλοῦ* as common name of *Labrus* in all species. *Χειλοῦσα* is clearly the same as *χειλοῦ.* My three specimens were obtained on different occasions and probably from different parties, making it evident that *χειλοῦ* is used for *Symphodus* as well as for *Labrus.*

152. Symphodus melops (L).

Apost. 25 (*Crenilabrus melops*).

153. Symphodus cinereus (Bonnaterre).

Apost. 25 (*Crenilabrus massa*).

154. Symphodus melanocercus (Risso).

Apost. 25 (*Crenilabrus cœruleus*).

155. Symphodus scina (Forskål).

Apost. 26 (*Coricus rostratus*).

156. Ctenolabrus suillus (L). H. * *Κατραϐάνος* $(_1)$.

Apost. 26 (*Ctenolabrus rupestris*).

157. Julis julis (L). H. * *Ταντάνο* $(_1)$.

Apost. 26 (*Julis vulgaris* and *J. giofredi*), † γύλος. According to Apostolides this is the ancient ἴουλος. Aristotle 610b 6 gives ἰουλίς (Latin *Julis*) as name of a fish found in schools; ἴουλος = down, hair, beard; also a centipede. Cf. Athen. vii, 70 and 20.

158. Thalassoma pavo (L).

Apost. 26 (*Julis pavo*), † γαϊτανοῦρι, † φιάμουλα at Patras, and † γραϐανάς at Trikeri. *Γαϊτάνι* is a Turkish word meaning a silken cord, a string (Cont. Lex.). *Γαϊτανοῦρι* would accordingly mean string-tail.

159. Xyrichthys novacula (L).

Apost. 27 (*Xyrichthys novacula*), † κατεργάρος and † κτένι, according to locality. The former means rogue, one condemned to work in the galleys (κάτεργα). *Κτένι* is M. G. for A. G. κτείς (gen. κτενός), a comb. *Κτείς* in A. G. was used as name of a bivalve, a cockle or scallop, often mentioned in Aristotle. According to Cont. Lex. the modern κτένι is used in same way, the sea comb.

Family **POMACENTRIDÆ.**

160. Chromis chromis (L). H. * *Σκαϑάρι* $(_1)$.

Apost. 27 (*Chromis castanea*), † καλόγρηα and καλογρίτσα. *Καλόγρηα* means a nun. *Καλογρίτσα* would seem to be another form for the same, although the lexicon (Cont. Lex.) gives it as meaning tomtit. *Σκαϑάρι* is probably a mistake here, the man who sold it me supposing it to be *Cantharus*.

Family TRACHINIDÆ.

161. Trachinus draco (L). H. *Δράκαινα* ($_2$).

Apost. 13 (*Trachinus draco*). According to Apostolides δράκαινα is common name for all species of the genus *Trachinus*. In A. G. δράκαινα is feminine of δράκων, a serpent or dragon. The kindred word δρακαινίς, also a feminine of δράκων, occurs as name of a fish in a fragment of the comic poet Ephippus, who flourished in the early part of the Fourth century, B. C. Also in a fragment of Mnesimachus. Aristotle 598a 11 uses δράκων as name of a fish which lives near the shore (i. e. a littoral fish). A fragment of Epicharmus also contains δράκων as name of a fish. Vide Athen. vii, 28.

162. Trachinus vipera (Cuv. & Val).

Apost. 13.

163. Trachinus araneus (Cuv. & Val).

Apost. 13.

164. Trachinus radiatus (Cuv. & Val).

Apost. 13.

Family URANOSCOPIDÆ.

165. Uranoscopus scaber (L). H. *Λίχνος* ($_1$).

Apost. 13 (*Uranoscopus scaber*), λίχνος, λοῦτσος and † κοῦκος. Identified in Apostolides with the καλλιώνυμος of Aristotle. For καλλιώνυμος see Aristotle 598a 11, 506b 10, 1529b 9.

According to Aristotle the καλλιώνυμος it a littoral fish with the gall on the liver, and has the largest gall-bladder of any fish in proportion to the size of the fish.

Aelian, N. A. 134, says: "Concerning it (the fish called καλλιώνυμος) Aristotle says that it has a large gall-bladder attached to the right lobe of the liver, and that it carries its liver in its left side."

According to Athenaeus, vii, 16 and 17, there seems to have been considerable confusion among the names ἀνθίας, καλλίχθυς, καλλιώνυμος and ἔλοψ." Pliny says (32, 146): Callionymus or Uranoscopus. (32, 69). The same fish (Callionymus) is also called *Uranoscopus* (sky-gazer), from the eye which it has in its head. Athen. viii, 52. Οὐρανοσκόπος and the one called ἄγνος, or also καλλιώνυμος, are heavy as food. Cf. A. G. κόκκυξ, sub. χελιδονόφαρο (*Dactylopterus volitans*).

Family CEPHALACANTHIDÆ.

166. Cephalacanthus volitans (L). H. *Χελιδονόψαρο* ($_1$), swallow-fish.

Apostolides 15 (*Dactylopterus volitans*), *χελιδονόψαρο*. Apostolides identifies this with the *κόκκυξ* of Aristotle. But may it not be the sea *χελιδών* spoken of by Aristotle 535b 27? He says: "The *κτένες* when they rush along, resting upon the water (which people call flying), make a whizzing sound, and the sea swallows (*αἱ θαλάττιαι χελιδόνες*) do the same, for these fly in the air not touching the water."

Cuvier identifies this sea swallow with *Dact. volitans.* Compare, however, *Trigla hirundo*, still called *χελιδόνα*, the swallow.

Of the *κόκκυξ*, cuckoo, Aristotle (598a 15 and 535b 20) says: "It makes a sound like the cuckoo, whence it gets it name." The *κόκκυγες* are both pelagic and littoral (alternately). Vide Plin. Hirundo, 9, 82 and 32, 149. Athen. vii, 84.

There is nothing in any reference that I can find to show that the *κόκκυξ* was a *flying* fish. According to Apostolides 13 *Uranoscopus scaber* is called *κοῦκος*, M. G. for cuckoo. May not this be *κόκκυξ*?

Family TRIGLIDÆ.

167. Peristedion cataphractum (L). H. **Κερατόψαρο* ($_1$), horn-fish.

Apost. 16 (*Peristethion cataphractum*), *καπώνη*.

Two specimens sold me under the name *καπώνη* in the market at Athens turned out to be *Trigla lineata* and *Trigla lyra*.

168. Trigla lineata (Gmelin). H. *Καπώνη* ($_1$).

Apost. 16 (*Trigla lineata*).

169. Trigla cuculus (L).

Apost. 16 (*Trigla pini*).

170. Trigla milvus (Lacépède).

Apost. 16 (*Trigla cuculus*).

171. Trigla gurnardus (L).

Apost. 16.

172. Trigla lyra (L). H. *Καπώνη* ($_1$).

Apost. 16 (*Trigla lyra*).

173. Trigla hirundo (Bloch). H. *Χελιδόνα* ($_1$).

Apost. 16 (*Trigla corax*).

Χελιδόνα is M. G. for A. G. *χελιδών*, swallow. Aristotle 535b 27. The sea swallows (*αἱ θαλάττιαι χελιδόνες*) fly in the air, not touching the sea, for they have their fins broad and long. See *Cephalacanthus volitans*, called *χελιδονόψαρο*. Cf. also *Myliobatis bovina*, Apostolides 9.

174. Lepidotrigla cavillone (Lacépède).

Apost. 16 (*Trigla cavillone*).

Family SCORPÆNIDÆ.

175. Scorpæna scrofa (L.) H. *Σκορπιός* ($_2$).

Apost. 16 (*Scorpæna scrofa*), † *σκορπίνα*. According to Apostolides *σκορπιός* is common name of *S. porcus*. *Σκορπίος* = scorpion. As name of a fish Aristotle, 1531a 20, 508b 17, 593a 7, 598a 14. It has many pyloric appendages, breeds (spawns) twice a year, alternates between the open sea and the shallow water along the shore; the *σκορπίδες* breed in the open sea (*τὸ πέλαγος*).

Athen. vii, 115. Num. "Red *σκορπίος*." Hicesius says: "Of the *σκορπίοι* one kind is pelagic the other littoral; the former is a fiery red, the latter blackish. Epicharmus calls the *σκορπίος ποικίλος*, variegated. It is solitary and eats seaweed. Aristotle mentions *σκορπίοι* and *σκορπίδες* in different places. It is not clear whether he means the same fish by these two names. That we have frequently eaten both *σκόρπαινα* and *σκορπίοι* and that the flavors and colors are different, no one is ignorant. Archestratus, in his "Golden Words," says: "Buy the small *σκορπίος*, but beware of a big one." Athen. viii, 52. The tawny, pelagic *σκορπίοι* are more nutritious than the large ones of the shoal water near shore.

176. Scorpæna porcus (L).

Apost. 16 (*Scorpæna porcus*), *σκορπιός* and † *χάφτης*.

Family CALLIONYMIDÆ.

177. Callionymus festivus (L). H.

Not noticed by Apostolides.

Family GOBIIDÆ.

178. Gobius niger (L).

Apost. 15.

179. Gobius jozo (L). H. *Κωβιός* ($_3$).

Apost. 14 (*Gobius jozo*), *κωβιός*, † *γωβιός*. According to Apostolides *κωβιός* and *γωβιός* are common names for all species of the genus *Gobius*. Aristotle *ϰωϐιός*, 610b 4, 598a 11 16, 508b 16, 569b 23, 621b 13 19, 567b 11, 591b 13, 601b 22, 835b 14. The *ϰωϐιός* has many pyloric appendages above the stomach, spawns near the land on the rocks, the bunches of eggs are flat and crumbling; it feeds on mud, sea-weed, sea-moss, etc.; lives near the land, gets fat in the rivers, and is found in schools. The white *ϰωϐιός*, found in the Euripus of Lesbos, never leaves that lagoon for the open sea as the other fishes found there do. Latin *Gobio* and *Cobio*, Plin. *Gobius*, Ovid., Hal. 12, 8. Martial 13, 88.

180. Gobius guttatus (Cuv. & Val).

Apost. 14.

181. Gobius auratus (Risso).

Apost. 14.

182. Gobius paganellus (L).

Apost. 14.

183. Gobius cruentatus (Gmelin).

Apost. 14.

184. Gobius capito (Cuv. & Val).

Apost. 14.

185. Gobius minutus (L).

Apost. 14 (*Gobius quadrimaculatus*).

Family BLENNIIDÆ.

186. Blennius pavo (Risso). H. * *Παπαγάλος* (1), an Italian word meaning parrot.

Apost. 13 (*Blennius pavo*), † *σαλιάρες*.

187. Blennius sanguinolentus (Pallas).

Apost. 13.

188. Blennius gattorugine (Bloch).

Apost. 13 (*Blennius gattorugine*), † *σαλιάρα*, slobbering.

189. Blennius ocellaris (L).

Apost. 14.

190. Blennius pholis (L).

Apost. 14.

191. Blennius trigloides (Cuv. & Val).

Apost. 14.

192. Blennius galerita (L).

Apost. 14 (*Blennius montagnei*).

193. Cristiceps argentatus (Risso). H. *Γῶπα* $(_1)$.

Apost. 14 (*Clinus argentatus*). For *γῶπα* see *Box*.

194. Tripterygion tripteronotus (Risso).

Apost. 14 (*Tripterygion nasus*).

Family OPHIDIIDÆ.

195. Ophidion vasalli (Risso). H. **Γιλάρι* or **χιλάρι* $(_1)$.

Apost. 28 (*Ophidium vassali*). *Χιλάρι* may be a diminutive from *χεῖλος*, lip.

196. Ophidion barbatum (L).

Apost. 28.

Family GADIDÆ.

197. Gadus callarias (L).

Apost. 28 (*Gadus morrhua*, the young of *G. callarias*). † *Μουρούνα* at Chalcis. Rare, according to Apostolides, but the identification must be doubtful.

198. Phycis phycis (L). H. **Ποντίκι* $(_1)$.

Not seen by Apostolides. *Ποντίκι*, M. G. for mouse. Cf. Aristotle, *ὁ ποντικὸς μῦς*, 600b 13, 632b 9.

199. Pollachius poutassou (Risso). H. **Τσιπλάκι* $(_1)$.

Apost. 29 (*Merlangus poutassou*), †*γαϊδουρόψαρον*.

The name *γαϊδουρόψαρον* is modern, meaning donkey-fish. *Γαΐδουρος* = *γάδαρος* = ass, donkey. The ancients called a certain fish *ὄνος*. ass. Dorio, in Athenaeus vii, 99, says some persons call the *ὄνος* (i. e. the fish *ὄνος*) *γάδος*. Epicharmus in his Marriage of Hebe says: " Wide-gaping *χάνναι* and monstrous-bellied *ὄνοι*." See Aristotle 599b 33, 601a 1, 620b 29, frag. 307, 1530a. According to Aristotle the *ὄνος* has a mouth opening wide (lit. breaking back), like the *γαλεοί*. It leads a solitary life, is the only fish which has its heart in its belly, has stones in its brain like mill-stones in form, and is the only fish which lies torpid in the warmest days under the reign of the dog-star, Sirius, the other fishes going into this torpid state in the wintriest days. The ὄνος, βάτος, ψῆττα and ρίνη bury themselves in the sand and after they make themselves invisible they wave the things in their mouths which fishermen call little rods or little wands (ραϐδία).

200. Merluccius merluccius (L). H. *Μπακαλάρο* (1).

Apost. 29 (*Merlucius vulgaris*), μπακαλιάρος. Cont. Lex. μπακαλάος. Turkish word meaning stock-fish. Μπακάλης (Turk) = grocer. Also written βακαλάος and βακάλης.

201. Mora moro (Risso).

Apost. 29 (*Mora mediterranea*).

202. Molva elongata (Otto).

Apost. 29 (*Lota elongata*).

Family PLEURONECTIDÆ.

203. Pleuronectes flesus (L).

Apost. 29 (*Flesus passer*).

204. Psetta maxima (L).

Apost. 30 (*Rhombus maximus*), † χαλκάνι.

205. Bothus rhombus (L).

Apost. 30 (*Rhombus lævis*).

206. Platophrys podas (De la Roche). H.

Apost. 30 (*Pleuronectes candidissimus* and *Bothus rhomboides*).

207. Eucitharus linguatula (L). H. *Γλῶσσα* (2).

Not noticed by Apostolides. For γλῶσσα see under *Solea solea*.

208. Solea theophila (Risso).

Apost. 29 (*Solea lascaris*).

209. Monochirus variegatus (Donovan).

Apost. 30 (*Microchirus variegatus*).

210. Monochirus hispidus (Rafinesque). H. * *Καψώρα*.

Not recorded by Apostolides.

211. Monochirus ocellatus L.

Apost. 29 (*Solea oculata*).

212. Solea solea (L). H. *Γλῶσσα* ($_1$).

Apost. 29 (*Solea vulgaris*), *γλῶσσα*, tongue. † *Χωματίδα* at Nauplia and Missolonghi. I found *γλῶσσα* a common name for any kind of sole. Ancient writers used *βούγλωσσος*, ox-tongue, as name of a kind of fish. The name is quoted by Athenaeus from various writers. Athen. iv, 13, Matro. "A *βούγλωσσος* which dwelt in the foaming brine (sea)" Vii, 30. "The roughish *βούγλωσσος*." The *κυνόγλωσσος* (dog-tongue) differs from the *βούγλωσσος*. The Attics call it *ψῆττα*. Vii, 139. Speusippus says that the *ψῆττα*, *βούγλωσσος* and *ταινία* are similar. *Βούγλωσσος*, *ψῆττα* and *μῦς* are given at the end of a list of fishes, the list being quoted from Aristotle. Dorio names *βούγλωσσος* and *ψῆττα* as belonging to the *flat* fishes. The Romans call the *ψῆττα* *ῥόμβος*, which is also a Greek name. Oppian Hal., i, 99.

It is plain from the above that the *βούγλωσσος* and *ψῆττα* were much alike, if not the same.

Family BALISTIDÆ.

213. Balistes carolinensis (Gmelin).

Apost. 12 (*Balistes capriscus*), † *μονόχοιρος*, lone-pig.

Family MOLIDÆ.

214. Mola mola (L).

Apost. 11 (*Orthagoriscus mola*).

215. Ostracion trigonus (L).

Apost. 12.

A West Indian species, said by Apostolides to have been taken at Skiathos, which is probably an error.

Family LOPHIIDÆ.

216. Lophius piscatorius (L). H. * *Πεσκανδρίτζα* or * *πεσκαντρίτζα* ($_2$).

Apost. 14 (*Lophius piscatorius*). Probably of Italian origin, meaning fisher. † *Χλάσκα* at Chalcis, † *σκλεμποῦ* and † *βατραχόφαρο* at Patras. The *βάτραχος ὁ ἁλιεύς* (the fisher frog) of Aristotle. See Aristotle 505a 6 b 4, 506b 16, 564b 18, 565b 29, 570b 30, 620b 11 ff, 695b 14, 696a 27, 749a 23, 754a 23 ff, 755a 9, 835b 13, 1527b 41–43, 540b 18.

Aristotle says with regard to the *βάτραχος*: "Inasmuch as the flat front part is not fleshy, nature has compensated for this by adding to the rear and the tail as much fleshy substance as has been subtracted in front." The *βάτραχος* is called the angler. He fishes with the hair-like filaments hung before his eyes. On the end of each filament is a little knob just as if it had been placed there for a bait. He makes a disturbance in sandy or muddy places, hides himself and raises these filaments. When the little fishes strike at them he leads them down with the filaments until he brings them to his mouth. The *βάτραχος* is one of the *σελάχη*. All the *σελάχη* are viviparous or ovoviviparous except the *βάτραχος*. The other flat *σελάχη* have their gills uncovered and underneath them, but the *βάτραχος* has its gills on the side and covered with skinny opercula, not with horny opercula like the fish which are not *σελαχώδη*. Some fishes have the gall bladder upon the liver, others have it upon the intestine, more or less remote from the liver and attached to it by a duct. Such are *βάτραχος*, *ἔλλοψ*, *συναγρίς*, *σμύραινα* and *ξιφίας*. (Proved true of *Lophius piscatorius* by a dissection by Dr. C. H. Gilbert.) The *βάτραχος* is the only one of the *σελάχη* which is oviparous. This is on account of the nature of its body. For it has a head many times as large as the rest of its body, and spiny and very rough. For this same reason it does not afterwards admit its young into itself. The size and roughness of the head prevents them both from coming out (i. e. being born alive) and from going in (being taken into the mouth of the parent). The *βάτραχος* is most prolific of the *σελάχη*, but they are scarce because the eggs are easily destroyed, for it lays them in a bunch near the shore.

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JULY 5.

The President, GENERAL ISAAC J. WISTAR, in the chair.

Fifty-four persons present.

JULY 12.

Mr. CHARLES MORRIS in the chair.

Fifteen persons present.

JULY 19.

Mr. CHARLES MORRIS in the chair.

Eleven persons present.

JULY 26.

Mr. BENJAMIN SMITH LYMAN in the chair.

Six persons present.

AUGUST 2.

Mr. CHARLES MORRIS in the chair.

Ten persons present.

AUGUST 9.

Mr. CHARLES MORRIS in the chair.

Nine persons present.

AUGUST 16.

Mr. CHARLES ROBERTS in the chair.

Seventeen persons present.